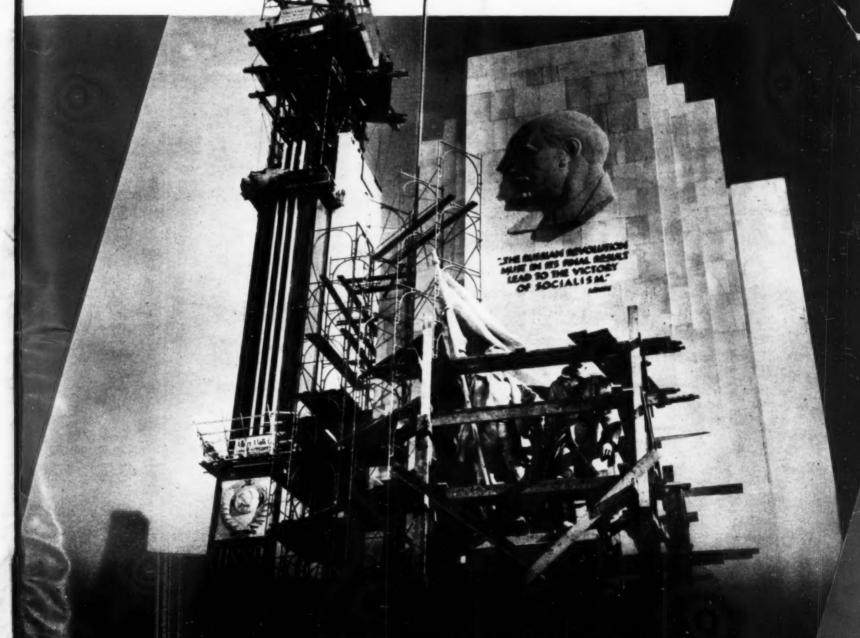
IAL SURVEY OF CURRENT PRACTICE, EQUIPMENT AND MATERIALS

PUBLIC LIBRARY First Copy Construction M. ... 26 1940



Wrecking Russian Building at N.Y. World's Fair

MARCH 1940

Washington Airport on Dredged Fill Material Handling on Housing Project

Standardized Cable For Scrapers Concrete Sheetpiles Form Seawall



Before You Plan Any Piling Job ... Talk to Inland!

There are possible time and money-saving short cuts on every piling job. Experienced and capable Inland Engineers, working daily on all kinds of piling projects, know how construction costs can be cut. They are ready to aid you with money-saving design and construction ideas as well as show you why Inland Steel Sheet Piling drives freely and straight, forms a tight job and can be reused many times. This Inland service is yours, without cost or obligation. Write for illustrated book on Inland Piling.

Sheets · Strip · Tin Plate · Bars · Plates · Floor Plates Structurals · Piling · Rails · Track Accessories · Reinforcing Bars

TECHNOLOGY DEF

STEEL CO.

PILING

38 S. Dearborn St., CHICAGO . District Offices: MILWAUKEE . DETROIT . ST. PAUL . ST. LOUIS . KANSAS CITY . CINCINNATI

CURRENT JOBS

.... and Who's Doing Them

BUILDINGS

Industrial—At Morenci, Ariz., steel work for a \$15,000,000 copper smelting plant for the Phelps Dodge Corp., went to Kansas City Structural Steel Co... Kansas City, Mo. For the Tennessee Valley Paper Mills, Inc., at Savannah, Tenn., Merritt-Chapman & Scott, of New York, obtained contract on a \$5,000,000 newsprint paper mill. For a recycling plant at Agua Dulce, Tox. Steams. Rogers Corp., was successful bidder with price of \$965,000. An electric switching station costing \$754,000 will be built at Trenton, N. J., by United Engineers & Constructors, Inc., of Philadelphia. Oil refinery will be built at Hattlord III. at cost of \$500,000 by Winkley Koch Engineering Co., of Hartford, Ill., at cost of \$500,000 by Winkler-Koch Engineering Co., of Wichita, Kan.

Commercial — Technology building at Evanston, Ill., for Northwestern University is under construction by R. C. Wieboldt Co., of Chicago, at cost of \$4,900,000. Costing \$1,000,000 an apartment project in East Chicago, Ind., will be built by Patrick Warren Construction Co., of Chicago. Stoneson Bros., of San Francisco, are building, at that place, a unit of College City on a 36-acre site to cost \$750,000. In Richmond, Va., John T. Wilson Co., Inc., local contractor, is building a \$500,000-addition to a bank building. In Houston, Tex., Eckert-Fair Construction Co., received \$465,000 contract for a telephone building.

Public—The Lafitte housing project in New Orleans, La., went to R. P. Farnsworth & Co., local contractor, for \$3,062,202. In Baltimore, Md., Consolidated Engineering Co., of Baltimore, will build the \$2,222,000 Latrobe Homes. Another New Orleans housing project at Iberville St. costing \$2,933,000 was awarded to J. A. Jones Construction Co., of Charlotte, N. C. Napier Homes housing project in Nashville, Tenn., will be built by Central Contracting Co., of Atlanta, Ga., for \$918,652. Successful contractor for Delaney Housing project in Gary, Ind., was Powers Thompson Co., of Joliet, Ill., with price of \$1,090,000. Housing project of 61 dwellings in El Paso, Tex., was bid in by Robert E. McKee, local contractor, for \$846,100. In Tampa, Fla., Riverview Terrace housing project costing \$797,000 will be built by Clausen Construction Co., of St. Petersburg, Fla. Storehouses at Naval air station at Jacksonville, Fla., will be built by Hillyer & Lovan. of Jacksonville for \$654,564. In Augusta, Ga., contract for Gilbert Manor housing project is Claussen-Lawrence Construction Co., of Augusta, with price of \$671,500. In Washington, D. C., Charles H. Tompkins Co., local contractor, will build Navy Place housing project for \$679,500. Low bidder for Holyoke, Mass., housing project was Casper Ranger Construction Co., local contractor, with tender of \$577,775. A bid of \$586,600 obtained for V. L. Nicholson & Co., of Knoxville, Tenn., housing contract in Bristol, Va. At McKees Rocks, Pa., W. F. Trimble & Sons., will construct \$965,500 housing project. Hospital building costing \$1,189,000 in St. George, N. Y., was awarded to Silverblatt & Lasker, Inc., of New York. Another hospital contract in St. George, N. Y., went to Caye Construction Co., of Brooklyn, for \$1,386,000.

HEAVY CONSTRUCTION

Missouri River revetment at Washington, Mo., will be installed at cost of \$582,398 by Massman Construction Co., of Kansas City, Mo.; in same locality additional revetment will be placed by Woods Bros. Construction Co. of Lincoln, Neb., for \$698,717. Dredging in vicinity of New Orleans, La., will be done by Shell Producers Co., of Tampa, Fla., for \$665,550. In Hammond, be done by Shell Producers Co., of Tampa, Fla., for \$665,550. In Hammond, Ind., \$3,000,000 sewage system and treatment works will be constructed by Bass Engineering & Construction Co., of Detroit, Mich. Sewage treatment works at Coney Island, N. Y., went to Stock Construction Co., of New York City, for \$1,263,784. In Montana and Washington, oil pipe line costing \$3,000,000 will be built by Williams Bros., of Tulsa, Okla. At Albany, Calif., a \$1,000,000 race track is under construction by J. A. Casson, local contractor. Dock for Standard Oil Co., at Baton Rouge, La., went to W. Horace Williams Co., inc., of New Orleans, for \$900,000. Minder Construction Corp., of Chicago, will build a subway station in that city for \$750,860. John Camp Drilling Co., of San Antonio, Tex., is putting down gas wells at Agua Dulce, Tex., at cost of \$650,000. Test chamber at airport in Dayton, Ohio, is being built by National Concrete Fireproofing Co., of Cleveland, for \$614,000.

HIGHWAYS AND RRIDGES II

Among recent contract awards are the following: Alabama: \$362,263 to Foster & Creighton Co., of Nashville, Tenn. Florida: \$452,904 to Ebersbach Construction Co., of Tampa. Georgia: \$253,429 to Hardaway Contracting Co., of Columbus, Ga. New Mexico: \$317,521 to Henry Thygesen & Co., Inc., of Albuquerque; \$344,533 to Cook & Ransom, of Ottawa, Kan. New York: \$734,404 to B. Turecame Contracting Co., of Brooklyn. Pennsylvania: \$509,399 to Booth & Flinn Co., of Pittsburgh; \$326,304 to Harrison Construction Co., of Pittsburgh; \$144,762 to Union Paving Co., of Philadelphia; \$594,913 to McNally & Hobeck. of Saginaw, Mich. Texas: \$253,655 to Briggs-Killiam Co., of Pharr, Tex.; \$258,818 to Vilbig Construction Co., of Dallas; \$243,476 to Gulf Bitulithic Co., of Houston.



For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

How STEEL STATUE was dismantled with aid of gir	
How PLYWOOD SHEATHING formed wall units for air	p. 43
ings.	- p. 43
How BUILDING WRECKERS salvaged Soviet Pavilion	
World's Fair for re-erection in Moscow.	- p. 46
How TUBULAR SCAFFOLDING was erected along wa	ils of Fair
building to permit stripping of marble.	— р. 49
How FLOODLIGHTING can be utilized to speed const night.	ruction by - p. 50
How CONCRETE PAVING VOLUME was measured by	subgrade
gaging templet.	- p. 51
How MOTOR TRUCKS WERE TESTED at special provin	
	-p. 52
How CHANNELIZATION was used to guide highway	
interchange.	— p. 53
How STANDARDIZED CABLE of preformed type improve tion of carryall scrapers.	— p. 54
How SMALL TOOLS perform useful service on construct	
now brains 100ab ponorm good service on constitu	— p. 56
How LAYING OF CABLE UNDERGROUND was done wi	th tractor-
hauled rooter.	— р. 58
How VIBRATION OF HOPPER with riveting hammer insur	
flow of concrete aggregates.	— р. 58
How SHEETPILES WERE PULLED with tripod and winch.	
How PIPE ALIGNING CLAMP held tubing for welding	— p. 58
How TRAILER HITCH was held safely by special pin.	— р. 59
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How TUNNEL LINING OF CONCRETE was placed with a	
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materials on housing project.	— p. 60
How GYPSUM BLOCK formed interior partitions in buildi	F
now GIFSOM BLOCK formed interior partitions in buildi	— p. 62
How CANAL BANKS WERE RETAINED by concrete shee	
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How BLASTING produced mile-long ditch.	— р. 69
How ASPHALT LINING was applied to canal sides an	
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How AIRPORT SITE was created by pumping fill from nec	
—p. 71 How PRECAST CONCRETE MANHOLES for electric utility service	
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"No—I don't care for that color shingle. I'd like a lighter blue—something on this order!"



"As soon as you're through there, I'd like you to mash these potatoes for me."



"Won't the boss be surprised when he finds out we know his sweetie!"

IO-MILLIONTH BARREL OF 'INCOR' 24-HOUR CEMENT



A TIMELY QUALITY APPRAISAL

SUMMING UP A 13-YEAR RECORD



THE FIRST BARREL of 'Incor' 24-Hour Cement was shipped in 1927. Now the TEN-MILLIONTH BARREL has been shipped. That is a lot of cement. But the paramount consideration is one of QUALITY, not quantity. For it is QUALITY which distinguishes 'Incor' as the FIRST high early strength Portland cement—quality written in terms of long-time durability in all kinds of construction, the country over.

'Incor' 24-HOUR Cement means just what its name says—uniform, dependable 24-HOUR service strength. AND LONG-TIME DURABILITY, TOO—proved by a 13-year performance record—a vital advantage EXCLUSIVE with 'Incor.'

Cement users are quality-minded, for the simple but fundamental reason that—
"the better the cement the better the concrete." Lone Star Cement Corporation,
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QUALITY PAYS ... INSIST ON 'INCOR'

LONE STAR CEMENT CORPORATION



PRINCIPAL SPECIFICATIONS

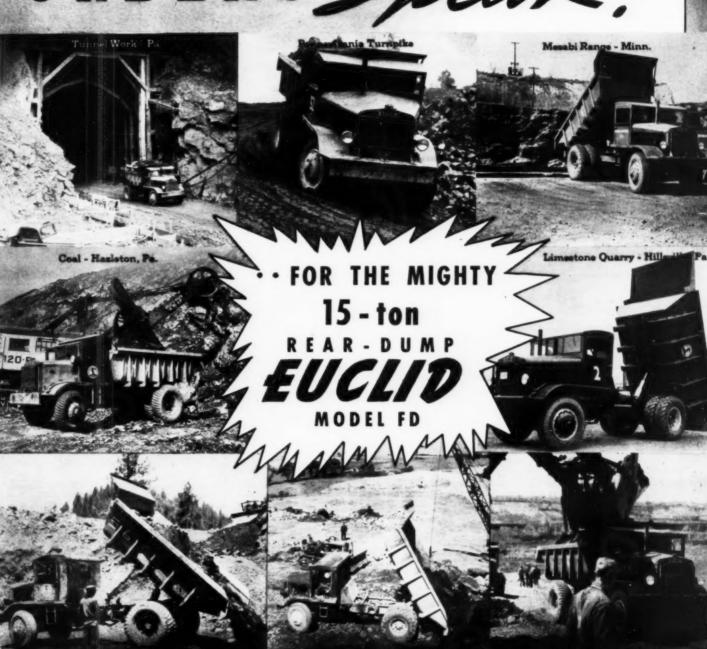
11/4 Yard MODEL 65 20-ton Crane

WEIGHT: 70,000 lbs. as Shevel
POWER: 6-cyl., 114 HP @ 1200 RPM
SHOVEL BOOM: 21' Chain Crewd
DIPPER STICKS: 16' Straddle
CRANE BOOM: 45' standard CRAWLER WIDTH: 10'-3"
CRAWLER LENGTH: 12'-10" GROUND PRESSURE: 10.2 lbs BASES: Unit Cast Alloy Steel DRUMS: Tandem, separate sha CLUTCHES: Booster operated CLUTCHES: Beester operated
GEARS: Helical cut
DIPPER TRIP: Power actuated
BEARINGS: All Machinery Shafts
BOOM HOIST: Wormgear or Independent
SWING SPEED: 4½ RPM
TRAVEL SPEED: ½ and 1½ MPH
LINE PULL: 17,000 lbs. @ 156 FPM
DRAGLINE PULL: 18,500 lbs. @ 145 FPM Here is a 11/4 yard convertible shovel with all the operating advantages and design characteristics - plus low first cost - that you want for big, economical output. Since 1935, Chas. J. Rogers, Inc., Deroit, has been a repeat buyer - volume repeat orders like this are the best testimonial we can offer as to dependable and outstanding performance of the BAY CITY. Your first step in experiencing lower operating and maintenance costs is to get a copy of our 32-page illustrated Catalog H-2 - write for itno obligation.

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SHOVELS . CRANES . DRAGLINES . TRENCH-HOES . SKIMMERS

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It will pay you to Consult us on your 1940 Requirements

THE EUCLID ROAD MACHINERY CO.



HERE'S THE BIG NEWS YOU'VE BEEN WAITING FOR

CUMMINS DIESELS

100,000 MILES

The Cummins Engine Company bases this warranty on the Cummins Dependable Diesel's PROVED record of performance in the hands of its owners. A record of thousands upon thousands of horsepower hours in the widest variety of power applications ever given any diesel engine. That's why we can confidently make this warranty . . . that's why we say: "The job YOU want done is NOW being done with Cummins Dependable Diesels."

THESE CUMMINS DIESEL firsts ARE YOUR PROTECTION

first—The Cummins Diesel was the first economical, cold starting, flexible, high-speed, tested and proved diesel to be offered to truck operators. Its eight-year record of performance has established its outstanding leadership in diesel value.

ANOTHER first The Cummins Diesel'is the

first diesel with a record of more than 1,000,000 miles on single engines.

ANOTHER first The Cummins Diesel is the first diesel among fleet operators, from coast-to-coast, who now have combined mileages of more than 150,000,000 miles on their Cummins Diesel-powered trucks.

SHOULD YOU BE SATISFIED WITH ANYTHING LESS THAMTHE

Page 8 - CONSTRUCTION METHODS - March 1940



ANOTHER first The Cummins Diesel was the first diesel to demonstrate its economy on BOTH long and short hauls . . . an all-over economy that includes not only more miles per gallon of cheaper fuel, but less maintenance, service and parts replacement.

ANOTHER first The Cummins Diesel was

the first diesel with a fuel distribution and injection system exclusively its own . . . 100% American in design and manufacture.

AND NOW ANOTHER first The Cummins Diesel is the first diesel to offer the purchaser a guarantee for one year or 100,000 miles. The Cummins Engine Co., Columbus, Indiana

THE first diesel in value and proved performance?

March 1940 - CONSTRUCTION METHODS - Page 9





• "How will it perform on my job?" That's what you want to know when you buy a Paving Breaker, Rock Drill, Clay Digger or any other tool. And that's what Thor is prepared to show



Paving Breakers

Thor Paving Breakers are hardhitting, non-rotating machines for breaking up concrete, asphalt, brick and stone pavements and walls and similar general demolition work.

Model No. 25 is an exceptionally powerful heavy weight machine of positive tubular valve design that is recommended for the hardest work. The new style Steel Retainer has all operating parts fully enclosed and dirt proof.

Model 25



Thor sump pumps are designed to work effectively under the most unfavorable conditions, operating even when fully submerged in dirty water, oil, sludge or sewage.

or sewage.

Model No. 381-T is highly efficient for hard continuous pump-

ing to high levels
— from 60 to 160
ft. head. At a total
head of 100 ft. at
90 lbs. air pressure
it pumps 110 gals.
per minute.

Model 381-T



Every Inch of Power From Every Foot of Air



Savings in air consumption as great as 25% are not uncommon to the users of Thor Contractors Tools. Basic reason for this air-economy is the exclusive principle of "Measured Air", which enables Thor Tools to utilize effectively ALL the air that enters the machine.

Clay Diggers

There is a Thor Clay Digger for every job, each specifically designed to do its job better. Minimum vibration and ease of handling insure steady, rapid work.

Model No. 18, while light in weight, is designed for heavy-duty digging in gravel, clay and hard-pan of unusual stiffness, frozen ground and other materials not quite hard enough to drill effectively. It is powerful, fast, and capable of standing rough usage. Drop forged steel construction. The Thor short-travel tubular valve insures low air consumption.

Model 18



INDEPENDENT PNEUMATIC TOOL CO.

600 W. JACKSON BLVD., CHICAGO, ILL.
Cochise Rock Drill Division
6200 E. Slauson Ave., Los Angeles, Cal.

CONTRACTORS TOOLS

O CONSUMPTION!

you. If you want proof of results, investigate the extensive Thor line of Contractors Tools. Check their power, speed, economy and reliability under your own operating conditions. Ask for a demonstration.

Sinker Rock Drills

Ease of handling . . . powerful rotation . . . effective hole cleaning . . . proper air cushioning . . . perfect balance — all these contribute to the low cost drilling performance of Thor Sinker Rock Drills.

Model No. 85-B is a medium heavy weight Sinker for deep down drilling in the hardest kind of rock. Outstanding features are its positive, short travel tubular valve . . . special bronze bushing for forward bearing of hammer . . . and automatic force feed lubrication.





Drifter Rock Drills

The three rugged machines in the Thor line of drifter rock drills differ only in size, each of which has its own particular application. All are exceptionally powerful, fast drilling machines, noted for their low air consump-

The No. 100-B Drifter is a 4-inch machine for use in heavy drifting, tunneling in the hardest formations, and deep hole drilling. It is a heavy weight machine with tremendous drilling speed and strength of rotation.

Model 100-B





Sheeting Drivers

Thor Sheeting Drivers can be quickly converted into Paving Breakers by the removal of only two head bolts. Sheeting Drivers have two removable side steps that enable the operator to ride the sheeting.

Model No. 25-S handles sheeting up to and including 3 inches thick. Either square or oblong rams are available.

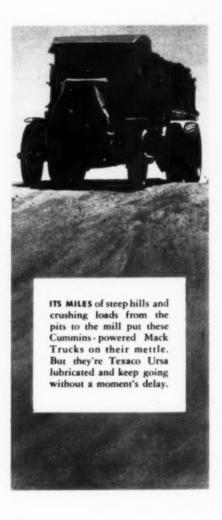
Model 25-S

MAKERS SINCE 1 8 9 3



Cummins Diesels Make 2-Year Perfect Score





not a moment's trouble in more than 2 years of hard, tough service.

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IN ITS SHOVELS, its trucks, for pumping, this mining operation depends entirely upon Cummins Diesel Engines.

For more than 2 years, these engines have been lubricated exclusively with TEXACO URSA OILS and "have not given a moment's trouble." In hard, hot, hilly mining service, Texaco Ursa Oils have kept these Cummins Diesels free from sludge, their rings free in

their grooves, their valves maintaining compression months on end.

To keep your Diesels in top condition, lubricate with Texaco Ursa Oils.

For engineers to help you select the right grade of Texaco Ursa Oil, phone the nearest of more than 2300 warehouses, or write:

The Texas Company, 135 East 42nd St., New York, N. Y.

TEXACO Ursa Oils for Diesels



THE FIELL CO.



HEIL-BAKER SCOOPS





* Load Easier *

angle - narrow cutting edge - curved rear gate — all cut loading resistance scienifically. The load rolls in and distributes uniformly. Better loads with

* Haul Easier *

Equal weight distribution at all times —low center of gravity—normal ground clearance of 15" or more if desired, plus the fact that the Carrimor requires only 4 wheels to give you easy rolling

* Dump Better *

When front apron is lifted out and up, ed instantly dumps from gravity and curved rear gate pushes out balance of load—even of sticklest material — quickly, easily, and clea

Available in 3 Sizes

9.0 yds. Struck. 12 yds. Heap 13.6 yds. Struck. 17 yds. Heap 25.0 yds. Struck. 33 yds. Hee

- ★ Load and Haul Big Rocks Direct from Shovel
- * Loads and Hauls More Material Faster, at Lower Cost

CARRIMOR—the scraper entirely free from overhead obstruction—makes it pos-, sible to load and haul from a power shovel. It gives you the versatility that eliminates the need of bringing in special hauling equipment on jobs where there is rock to haul as well as normal scraper work to be done. Thus, Carrimor assures an extra way to cut your costs:

Compare them feature for feature and you readily see where LaPlant-Choate engineers have given you extra value in every detail. Low center of gravity. high clearance . . . equal weight distribution on all four tires (loaded or empty) high lifting, full opening front gate . . . three-piece reversible cutting edges and many other LaPlant-Choate features protect your investment in Carrimor equipment.

Don't be satisfied with partial profits on your jobs. Get the maximum. Put new LaPlant-Choate Carrimor Scrapers to work now. Designed for "Caterpillar" Track-type tractors. Get full details today. Sold and serviced by all LaPlant-Choate and "Caterpillar" dealers.

BULLDOZERS RUBBER WHEELED WAGONS **SNOW PLOWS**

LA PLANT-CHOAT Mufacturi CEDAR RAPIDS, IOWA.

TRAIL BUILDERS **BRUSH CUTTERS** TAMPING ROLLERS



RAINS -CAME!

Dump Trailer to make his profits safe in any kind of weather . . . under any conditions...at any season of the year. Get profitable speed off-the-pavement in any weather—hauling with Athey

Forged-Trak Trailers. Use them to shorten the shovel swing . . . to get through loader spill which ties up trucks . . . to save you road maintenance . . . to dump fast and clean over the very edge of the fill. See your "Caterpillar" dealer or write-

The rains came-and Harry Hatfield, of Barboursville, West Virginia, watched his trucks flounder and stick in the mud. But Mr. Hatfield's profits weren't entirely tied up-for he had MECHANIZED with a 16-yard Athey Forged-Trak 2-Way Dump Trailer. And where his trucks couldn't operate, the big Athey Forged-Trak Trailer and "Caterpillar" D8 Tractor were working profitably as usual.

That's why Mr. Hatfield promptly ordered another 16-yard Athey Forged-Trak 2-Way

Motor trucks can operate efficiently on smooth roadways-that's why the army uses motor trucks to speed men and ammunition close to the scene of battle quickly.



But for the actual attack-on the battlefield—the army is mechanized with tanks. Motorize AND mechanize to beat hauling hazards and limitations.

ATHEY TRUSS WHEEL CO.

5631 West 65th Street, Chicago, Illinois Cable Address: "TRUSSWHEEL" Chicago ATHEY FORGED-TRAK WAGONS AND TRAILERS



JAEGER, ALONE, Gives You All These Pumping Features

Only \$85 f.o.b. Factory—3000 Gallon Bantam Weighs But 52 Lbs. JAEGER "PRIMING JET" — Up to 5 times faster priming and re-priming — often means difference between profit and loss on job. No adjustments — no need to "gun" engine.

POSITIVE RECIRCULATION CUT-OFF

— It's controlled by flow, not pressure.

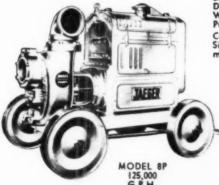
"FULL-RANGE" IMPELLER gives high efficiency under all conditions (built of steel in 4" to 8" sizes).

ACCESSIBLE SEAL — always outlasts the impeller.

PATENTED SELF-CLEANING SHELL — scours while pumping, won't clog, easily accessible.

DEPENDABLE, LONG LIFE CONSTRUCTION — means thousands of EXTRA hours of service.

EVERY PUMP INDIVIDUALLY TESTED for capacity and pressure before it leaves our factory.



Send for Prices and New Catalog Describing Complete Line of World's Champion Sure Prime Pumps:

Compact 2", 3", 4" and 6" Sizes—Heavy Duty and Intermediate Types.

8" and 10" Sizes, Most Portable Big Pumps on Market — Capacities to 220,000 G.P.H.

Convertible Jetting-Dewatering Pumps (Twc Pumps in One).

Vertical Caisson Pumps Well Point Systems Triplex Road Pumps,





THE JAEGER MACHINE CO.

800 Dublin Ave. COLUMBUS, OHIO

POWE



ER IN OVERALLS!

With no pretense to beauty, "Caterpillar" Diesel Engines are designed "one hundred per cent" for performance—anywhere! Set them in a shack or out on a rock pile. . . . Spike them onto a couple of cross-timbers. . . . Put them on the roughest, toughest jobs you have—and watch 'em go to it! Day-and-night going won't daunt them. Long stretches of heavy, varying, torturing loads are all in the day's work. They'll put up with punishment that would send many a less carefully engineered engine into an early repair bill. Power in overalls—that's "Caterpillar" Diesel!

The history of "Caterpillar" Diesels proves

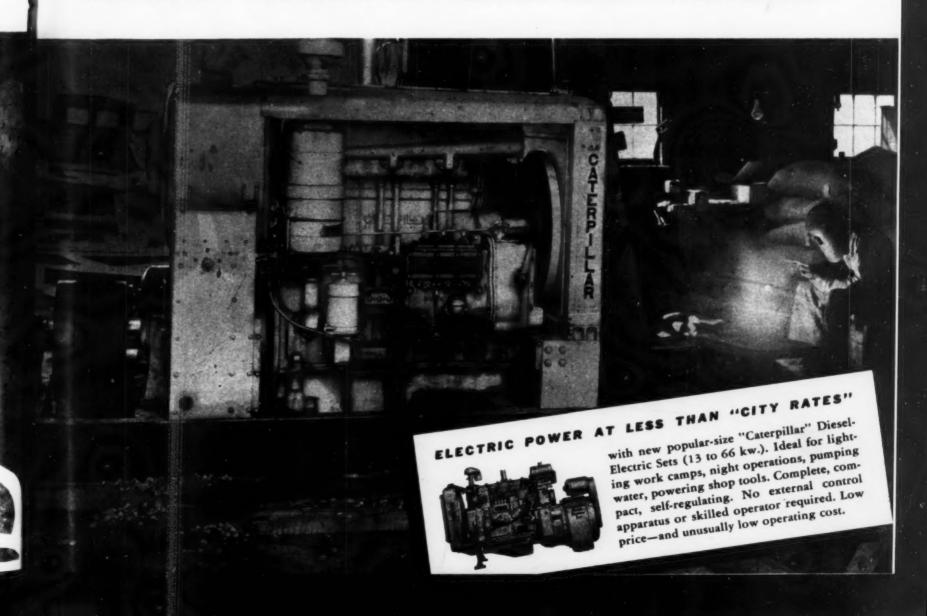
their ruggedness, stamina and durability. Records of 10,000, 20,000 even 30,000 operating hours are not uncommon. And big savings in operating costs are no less extraordinary. . . . Fuel, the principal item, often runs as little as one-fourth the cost of other types of power. Maintenance, under normal care, likewise is low. Altogether, there's nothing to compare with Diesel power as represented in "Caterpillar" Diesel Engines today.

CATERPILLAR TRACTOR CO., PEORIA, ILL.

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CATERPILLAR

DIESEL ENGINES . DIESEL-ELECTRIC SETS . TRACK-TYPE TRACTORS . ROAD MACHINERY





1500 HOURS

without a brake adjustment made possible by this

NEW P&H CONTROL

... and this is only one of the many P&H advantages that are driving excavating costs to a lower level than ever thought possible.

SEND FOR THIS NEW BULLETIN

In addition to faster, simpler operation P&H's new excavator control brings you the benefits of full floating brakes, automotive type clutches, electric dipper trip and many other cost-cutting features. You'll find all the facts in Bulletin X-60.



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FEGER EXCAVATORS - ELECTRIC CRANES - ARC WELDERS (HOISTS - WELDING ELECTRODES - MOTORS

Page 20 - CONSTRUCTION METHODS - March 1940

WISSCOLAY PREFORMED

> REGULAR LAY NON-PREFORMED

EACH HAS

WICKWIRE ROPE There is no question that for most purposes preformed wire rope offers many advantages of economy and convenience over non-preformed. Preformed rope is easier and quicker to install as it has no tendency to loop. It spools more evenly so is less apt to be crushed from poor winding. A broken wire does not go wild to destroy its neighbors. When free, a preformed rope has no tendency to twist or to unlay. Both types of the same construction offer the same resistance to abrasion. For uses where abrasion is a factor it may be more economical to use non-preformed. Wickwire Rope is made in both non-preformed and in Wisscolay Preformed. Wickwire rope engineers will gladly tell you the most economical type to use. In either case be sure it's a Wickwire Rope thus you are assured of the longest possible rope life.

WICKWIRE SPENCER STEEL COMPANY

General Offices: 500 Fifth Avenue, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City



America Demands R.. GMCs GOT IT POWER-PAK PISTONS

GMCs are the most powerful of all trucks-engine for engine and size for size-from 1/2-ton to 15 tons. Moreover, for greater safety and driving ease, GMC alone offers Ball-Bearing Friction-Free steering as standard in all medium and heavy-duty models. This exclusive GMC feature reduces steering effort as much as 57% under actual tests. Prove this greater power and ease of handling to your own satisfaction by driving one of these mighty GMCs-testing it under your own loads! And remember . . .

GMC PRICES ARE RIGHT DOWN WITH THE VERY LOWEST!



AND GMC's EXCLUSIVE COMBUSTION CHAMBER COMBINE TO GIVE YOU THE GREATEST GAS ECON-OMY OF ANY TRUCKS!

Owners Report 15% to 40% gas savings. Your GMC dealer will prove savings with the Mileage Meter!

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pe

ONLY GMC **GIVES ALL THIS EXTRA VALUE**

SUPER-DUTY Engines • POWER-PAK Pistons • RIDER-EASE Cabs • QUICK-VISION Instrument Panels • BALL-BEAR-ING Friction-Free Steering in Medium and Heavy-Duty Models • SYNCRO-MESH Transmissions (standard in heavy-duty models) • SEALED-BEAM Headlamps.



Our own YMAC Time Payment Plan assures you of lowest available rates

MC TRUC GASOLINE

TO SINGLE TRACTOR-SCRAPER OPERATION THIS LeTOURNEAU CARRYALL HAS ADDED





This extra capacity is earned with these exclusive LeTourneau features of design:
Expanding bowl of the "U" model Carryall Scrapers, which, in effect, is like loading two small scrapers. As the dirt piles in the rear bucket—that rides to the rear of the Carryall on bearings. Thus, loads are piled high the entire Scraper length, at much less tractor effort.

Based on actual weighed* measurements, this LeTourneau "SU" Carryall Scraper (14 yards struck capacity) ... making trip for trip with another single tractor-operated scraper...digs and delivers 2 extra pay yards a trip. Figured over 9 trips per 50-minute working hour on a 600-foot one-way haul, the "SU" delivers 144 extra pay yards every 8-hour shift for the same D8 tractor borsepower!

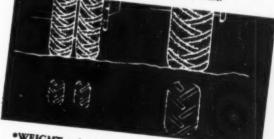
For argument's sake, figure that extra profit at the price you're getting per yard ... and you'll just begin to realize why you can't afford to own

and operate any other scraper at any

A demonstration shows you how to pocket these extra savings. And, if it's extra pusher-scraper profit you're after ... your LeTourneau and "Caterpillar" dealer will double that extra pay yard performance right on your own job with this same Carryall ... and show you how your pusher tractor will double up on your job to extend Carryall work range another 30% with a LeTourneau Rooter! See him, or write R. G. LeTOURNEAU, INC., Peoria, Ill., Stockton, Calif.



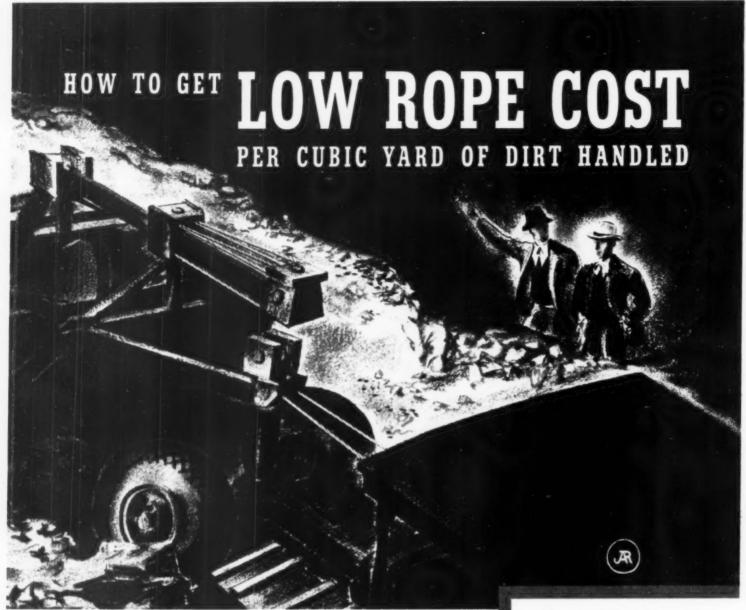
Extra-large tire "flotation" engineered to the fullest load capacity, so there's rarely an overload, gives greater ground contact than smaller duals to keep on top of soft materials and lighten draft.



*WEIGHT only determines actual pay load. Every LeTourneau demonstration is equipped with scales when requested.

ANGLEDOZERS" BULLDOZERS, ROOTERS", POWER CONTROL UNITS, DRAG SCRAPERS, PUSHDOZERS, SHEEP'S FOOT ROLLERS, CRANES, TREEDOZERS.







Do you realize how much wire rope life-wire rope cost-depends on wire rope selection? The truth is-you can waste a lot of wire rope money, unnecessarily, if your ropes are incorrectly selected.

Just glance at the factors in the panel to the right. They are just a few of the many which have to be considered in selecting rope-in order to cut down rope costs to the lowest point.

Exceptionally small sheaves, for example, mean sharp bending of the wire rope...call for a highly flexible rope. Sudden shocks call for high breaking strength and fatigue resistance. Dirt that gets into sheaves demands rope that will stand up under severe abrasion. In other words-any old rope won't do! So we recommend:

1 The use of Roebling "Blue Center" Wire Rope, either standard or preformed-the finest, toughest rope of all the ropes which Roebling makes;

2 Careful selection of exactly the Roebling "Blue Center" Wire Rope needed to meet your particular conditionswith the cooperation of the nearest Roebling representative, who will make available to you Roebling's years of experience in rigging contractors' equipment of every type. Call on Roebling-to help you get lowest rope cost!

WISE CONTRACTORS use rope exactly suited to their conditions ...

Selecting wire rope for use on rope-rigged contractors' equipment should not be merely a mat of ordering a rope of a certain type and size.

To obtain longest possible rope life—lowest possible rope cost per cubic yard of dirt handled—it is necessary to consider many factors and to carefully select exactly the rope which is best suited to your equipment and to the conditions under which it operates.

Amongst those factors which should be taken into consideration are, for example, the following:

- 1 Size of sheaves . 2 Number of bends
- 3 Loads-stresses and sudden shocks to which the rope may be subjected in operation

To assure rope economy-let Roebling cooperate with you in determining the right rope for each of your rope-rigged machines.

JOHN A. ROEBLING'S SONS COMPANY Branches in Principal Cities

ROEBLING "BLUE CENTER" WIRE ROPE

STANDARD OR PREFORMED



"Our results so far indicate that New RPM DELO can be highly recommended for Buda Diesel Engines, and is a superior lubricant in every respect."

One look at The Buda Company's tough engine tests—and you'll see why! Two engines, a six-cylinder and a four, were broken-in and run on New RPM DELO—many hundreds of hours at full speed. On top of that the six-cylinder Buda was pushed 10% above normal rated horsepower.

But this punishment didn't mean a thing to New RPM DELO! Every piston ring was free—power seal perfect. Yet Buda has found that other oils tested under the same conditions of speed and load would stick rings long before completion of these tests.

More! Buda's bearings showed no

sign of corrosion. And New RPM DELO brought pistons, rings, liners through this severe run smooth and unworn.

Users of all types of Diesels as well as leading engine manufacturers are proving the exceptional performance of New RPM DELO. Make money by choosing it for *your* Diesel equipment.

New "RPM" Diesel Engine Lubricating Oil is available everywhere in the gray barrel with the blue head



Order from Your Nearest Distributor as Listed Below:

IN THE UNITED STATES

The California Company (Montana only)
Humble Oil & Refining Company
Standard Oil Company (Indiana)
Standard Oil Company (Nebraska)
Standard Oil Company of California
Standard Oil Company of Texas
Utah Oil Refining Company

Diel RPM DELO:

The Carter Oil Company, Tulsa, Oklahoma Colonial Beacon Oil Company Standard Oil Company of Louisiana Standard Oil Company of New Jersey Standard Oil Company of Pennsylvania

Kyso RPM DELO: Standard Oil Company (Inc. in Kentucky)

> Signal RPM DELO: Signal Oil Company

Sohio RPM DELO: The Standard Oil Company (Ohio)

IN CANADA & NEWFOUNDLAND imperial RPM DELO: imperial Oil Limited

IN BRITISH COLUMBIA & ALBERTI

Standard Oil Company of British Columbia Limited

THEOUGHOUT THE WORLD

RPM DELO is available through distributers in more than 100 countries.

STANDARD OIL COMPANY OF CALIFORNIA



EIMCO-FINLAY LOADER

Seven years of world-wide usage in "hard-rock" mines, and corresponding experience in the development of all-steel designs so simple and powerful that they are practically fool-proof, have combined to make the Eimco-Finlay Loader a "natural" for mucking out small and medium-size tunnels. The Model 12-B Eimco-Finlay is NOW saving big money for many users in tunnels as small as 5 ft. wide by 6 ft. high—loads cars up to 50 cu. ft. capacity at the rate of a ton per minute. The Model 21 is being used with equal success in tunnels up to 12 ft. x 12 ft.—loading cars up to 90 cu. ft. in capacity at the rate of two tons per minute.

Both models are self-tramming within the limits of their air-hose connection (up to 200 ft.), but can be thrown into "free-wheeling" instantly

for hand or power-tramming from one heading to another. Air consumption for the Model 21 is about the same as for a "drifter" drilling machine, and correspondingly lower for the Model 12-B. Both first cost and maintenance expense are much less than for any electrically-operated machine of comparable mucking capacity. Safety is promoted—especially in wet places—by elimination of electrical break-downs, shocks and fatalities.

Complete information regarding the design, construction and operation of the Eimco-Finlay Loader, together with drawings and data describing its use at the present time in four different types and sizes of tunnels, will be furnished promptly on request without charge or obligation of any kind. All we ask in return is the name of your company and your own position or title.



EIMCO PATENTS

give exclusive rights to the use of the specially-shaped rocker-erm illustrated above. No other known method for controlling the action of a loader bucket permits such simple sturdy construction or gives such high efficiency. Other Eimco petents covering our positive automatic centering device, digging-width and crowding-thrust stops, etc., are equally important.

THE EIMCO CORPORATION, Salt Lake City, Utah, U.S.A.

NEW YORK 330 W. 42 St. CHICAGO 333 No. Michigan Ave. EL PASO Mills Bldg. SACRAMENTO 1217 7th St.

NORTHWEST:

- Equipped with all of these Northwest features — proved in the field in actual service! Helical Gear Drive, Uniform Pressure Swing Clutches, "feather-touch" clutch Control, Cushion Clutch, Dual Crowd, Northwest Welded boom and dipper sticks, ball or roller bearings on all high speed shafts, worm boom hoist, Northwest

mobility, travel mechanism fully enclosed and run ning in oil.

- Like all Northwests - a real Rock Shoyel!

 And when you have a real Rock Shovel you never have to worry about output in dirt.

NORTHWEST ENGINEERING COMPANY

1728 Steger Building 28 E. Jackson Blvd. Chicago, Illinois Convertible to CRANE DRAGLINE

Like all NORTHWESTS a Real

GASOLINE ELECTRIC DIESEL

Built in a range of 18 SIZES 3/8 yd. capacity and Larger

-and
when you have
a real Rock Shovel
you won't have
to worry about
output in dirt

What OIL for GEARS?

For lowered replacement cost, less noise and more power transmitted, the right lubricant is essential

INSIDE YOUR GEAR BOXES, nearly everyone is agreed on what the proper lubricant should do. It should: (1) lower replacement cost by holding wear to a minimum; (2) cut down power losses; (3) give quiet operation.

The difficulty comes when you try to prescribe the lubricant which best accomplishes all three jobs in any individual set of gears. And since noise is the symptom of trouble most easily observed, too often a hasty operator simply pours in a heavy oil, gets a quieter action, and hands himself a medal for his smartness. He may discover later that he has raised his power cost by 15%.

HIGH PRESSURE, SMALL AREA

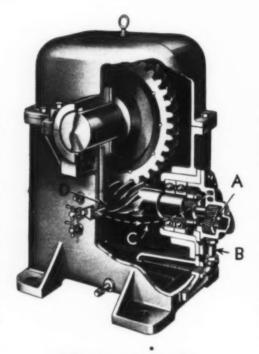
Here's the chief reason why gear lubrication is difficult. Your lubricant must form an oil film—

Not between two flat surfaces
Not between a concave and a convex
surface
BUT between two convex surfaces.

It is possible even between two convex surfaces to form the oil wedge which gives the most effective film. But it's the most difficult condition

DRIVER

Diagram showing how the meshing teeth of spur gears, under ideal conditions, form an oil "wedge."



Worm gear set with self-contained oiling system

A-Gear-type oil pump.

B-Suction line to oil pump.

C—Oil lead from pump to spray nozzle.

D—Spray nozzle to gears.

of all. As the teeth slide over each other, the oil-wedge action is abrupt, and intense pressure is forced upon a small area. (See diagram at left.)

HOW FAST DO THEY TURN?

The speed of each gear closely affects the formation of the necessary oil

> film. Slow-moving gears with large teeth need an oil film which stands up under pressure.

On the other hand, a

high speed may tend to throw the oil away from the meshing surfaces. Speed must be carefully considered when you set out to get the best oil for any gear box.

NEW GEARS, AND GEARS NOW

What of the design of your gear teeth? In worm gears, for example, a large helical angle helps to form a strong oil film. But the sliding action in such a gear increases heat. So you're apt to need a heavier oil than you would for a spur gear operating under like conditions.

Further, the design of gear teeth tells what they were like when new. But it may be even more important, in selecting a lubricant, to find what the teeth are like now. After a certain amount of wear, tooth contact often hits just "the high spots"... and again you need to modify your lubricant.

All these factors and others, too, must be considered in any attempt to find the oil which attains the three vital objectives in your gears. Shell has studied the problem and will continue to study it. We have found that the right selection for any set of gears involves choosing from a wide range of lubricants.

Call in your Shell representative; give him the opportunity to study your gears in day-by-day operation and recommend the lubricant that will give the most satisfactory service at lowest cost.

Shell Industrial Lubricants



THE IRON HORSE IS ON A DIET

• Studies show that a conventional steam locomotive in mainline passenger service averages 28 cents per mile for fuel and upkeep costs. That was before the Doctors of Design took things in hand. With welded construction, they've turned this iron horse into a light-weight speedster.

This Diesel-powered streamliner with a three or four car train does the same amount of work and consumes only 7 cents worth of fuel and upkeep per mile-a far cheaper diet. The streamliner has not only cut operating costs but it has sent traffic zooming up, greatly improving the complexion of railroad business.

What welded steel construction has done for the iron horse, it has also done for thousands of other metal products and structures from small appliances to ocean-going vessels. Have you investigated fully its possibilities for your products?

Did you know these facts about welded steel construction? (1) Welding gives you engineering freedom for greater design ingenuity, resulting in better product performance, improved appearance and lower costs.

(2) Welding fuses component parts together directly, eliminating connecting members, reducing weight.* (3) The material used is of uniform high quality, affording maximum strength and rigidity. (4) Welding eliminates many production operations, saving time and money.

For counsel on arc welding design and practice, phone the nearest Lincoln office or write THE LINCOLN ELECTRIC COMPANY, Dept. G1, Cleveland, Ohio. Largest Manufacturers of Arc Welding Equipment in the World.

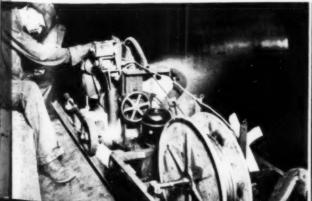
LINCOLN "SHIELD-ARC" WELDING

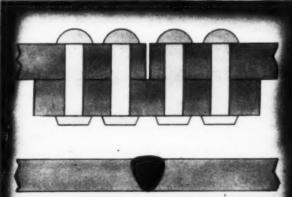
Unites design ingenuity with superior structural materials for progress

AUTOMATIC. The Lincoln Electronic Tornado produces welds of shielded arc quality for high-speed, low-cost manufacture and construction work. Here, the Tractor Type Tornado fabricates an oil storage tank. Photo courtesy Chicago Bridge & Iron Co.

*FOR EXAMPLE. Top joint is riveted. Bottom one is "Shield-Arc" welded. It is stronger than the parent metal. Elimination of connecting members and ability to use lighter material in welded structures accounts for savings in weight of 10% to 35% over riveted construction.

A STRONGER BRIDGE. Stringers are reinforced by welding on I-beams with webs cut as shown Old wooden plank flooring is replaced with welded steel grid type flooring and concrete







FOR THE CONTRACTOR



Lexington Avenue, New York. Paving half at a time kept street open constantly. Traffic on 24 hr. concrete. Entire operation completed in three-fourths the contract time.



Auto Hotel, Inc., Bloomington, Ill. Temperature average, 20° F. Form removal in 3 days cut 8 days from construction time for first two floors. \$1580 avecton labor, curing, forms and overhead.



New Hampshire State Highway Bridge. Open to traffic five days sooner. Quick curing saved on cold weather heat protection cost. Quick use of floor slab saved a two mile haul for gravel.



hours. Quick curing reduced frost risk. Owner's urgency for quick occupancy was satisfied.

CONCRETE of service strength in one-third to one-fifth the usual time. With Lehigh Early Strength Cement the contractor gets this "extra." In 24 to 48 hours it equals the strength of normal portland cement at 7 days. This time-saving gives the contractor big advantages—advantages which often reduce costs.

Produces better, denser concrete.

Saves loss of time of waiting for concrete to harden. In cold weather heat protection cost is less by one-half to two-thirds.

Reduces form costs by quick removal and re-use.

In road and street work, 24 to 48 hourold concrete often can be opened to traffic. Equipment and materials can be moved over it. Intersections can be opened to reduce hazard, cost and nuisance of detours and barriers.

In building construction quick service concrete permits quick use of floors as working bases—no long wait for plumbers, electricians and other trades. Steel work and masonry need not be delayed.

For any type of construction, quick use of concrete helps co-ordinate schedules for practically continuous operation, shortens construction time and reduces overhead expense.

For your next job, figure both ways—with Lehigh Normal Cement—with Lehigh Early Strength Cement. The Lehigh Service Department will gladly answer any questions.



LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA., CHICAGO, ILL., SPOKANE, WASH.



You don't have to accept Lorain simplicity on anyone's say so. Just look at this turntable. Note the use of fewer and strong parts—trace the direct flow of power—check the accessibility of the entire assembly. Then compare it point-for-point with any shovel or crane turntable on the market today. Your eyes will give you the answer to the true simplicity of Lorain's basic Center Drive design.

But don't stop there. Step up into the cab of a Lorain. Find out for yourself how "alive" it is—how easily and quickly the clutches respond—how power concentrates just where you want it.

If you feel, as do most contractors, that simplicity of design has an important bearing on the life and earning power of a shovel or crane, it's to your ad-

vantage to look at Lorains. Then
you can see for yourself and
judge for yourself what constitutes real simplicity.

THE THEW SHOVEL COMPANY LORAIN, OHIO



From the approved hot rolled wire rods through Macwhyte's furnaces, cleaning, baking, cold drawing of wire, and fabrication of wire into wire rope-at every step of the way Macwhyte PREformed Wire Rope is made to make good. Ask for a Macwhyte Wire Rope Recommendation.

REEL

LABORATORY TESTED FIELD PROVED

with the Internal lubrication

When you ask the man who's used it, he'll tell you, "Macwhyte Wire Rope has saved us a good many rope dollars."

A Macwhyte recommendation may save you a good many rope dollars too. Our engineers are always at your service, why not tell them your problems?

. . . . Macwhyte stocks are conveniently located so that you get WHAT you want WHEN you want it. For low cost operation, buy MACWHYTE PREformed.

MACWHYTE COMPANY

KENOSHA, WISCONSIN

New York . . Pittsburgh . . Chicago . . Ft. Worth Portland . . Seattle . . San Francisco (With distributors throughout the U.S. A.) 'Manufacturers of wire rope and braided wire rope slings for every use."

NOT JUST A BUY BUT AN INVESTMENT

ROAD FINISHING MACHINES

ROAD FORMS

BULK CEMENT PLANTS

BATCHERPLANTS

CENTRAL MIXING PLANTS

WEIGHING BATCHERS FOR AGGREGATES, CEMENT AND WATER

STEEL STREET **FORMS**

CLAMSHELL BUCKETS

CONCRETE BUCKETS

TRUCK MIXERS

TRUCK MIXER LOADING PLANTS

READY MIXED CONCRETE PLANTS

TAMPING ROLLERS

STEEL FORMS
FOR GENERAL CONSTRUCTION

STEEL GRATING

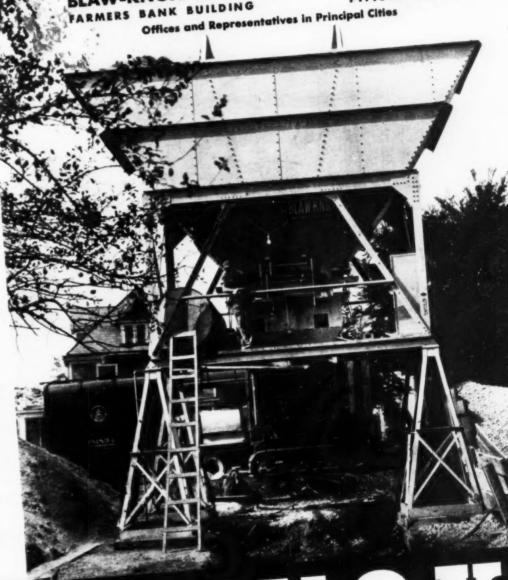
STANDARD STEEL BUILDINGS

Blaw-Knox Company manufactures only equipment which meets a high quality standard. It may sometimes be a little higher in initial cost than machinery of inferior quality.

It is always cheaper in the long run.

BLAW-KNOX DIVISION OF BLAW-KNOX CO.

MERS BANK BUILDING



1317 CONSTRUCTION EQUIPMENT

It's Full Speed Ahead on the LAUREL HILL TUNNEL JOB



OLD MAN WINTER isn't slowing up work in the Laurel Hill Tunnel of the new Pennsylvania Turnpike. This huge tunnel, awarded to Hunkin-Conkey Construction Co., is nearest to completion of the seven Turnpike tunnels.

And here's the important part "Ventube" rubberized ventilating duct plays in speeding up work on this job! "Ventube" delivers 100% blower capacity. It is lightweight and easy to handle . . . one man can install the whole system within a few hours. It is flexible, and easily turns corners without impeding the flow of fresh air through the smooth interior.

"Ventube" gets right up to the heading, where plenty of fresh air is needed most of all! During blasting the sections nearest the face easily slide back to prevent damage. Immediately afterwards "Ventube" slides forward again, bringing clean, fresh air from the outside. And all you need besides "Ventube" to assure best ventilating is a motor-driven fan of proper capacity.

"Ventube" is tough and durable, too! It's made of carefully selected, extra-strong fabric. Even the thread that goes into "Ventube" is chemically treated to resist fungus growth. Then the fabric is both coated and impregnated with rubber to resist acid, gases, fungus and moisture!

Try a few sections of "Ventube" where you can give it the most difficult test. See how quickly and easily it can be suspended and taken down . . . how it delivers clean, fresh air . . . how it helps speed up work and cut costs! Write Du Pont today for additional information.

DU PONT ON THE AIR—Listen to "The Cavalcade of America" every Tuesday, 9 p. m., E. S. T., over National Broadcasting Company Networks.



E. I. DU PONT DE NEMOURS & COMPANY (INC.)
"FABRIKOID" DIVISION - FAIRFIELD, CONN.

""WESTERM" Is Do Pout's registered trade mark designating its rubber impregnated flexible contileting duct.

This roomy, compact powder bag is made of the same sturdy material as is "Ventube." The seams are sewed as tough as rawhide—and the fabric is coated and impregnated with thick, resistant rubber. Du Pont powder bags are available in several sizes. Write for sizes and prices.





Low Cost OUTPUT for SALE

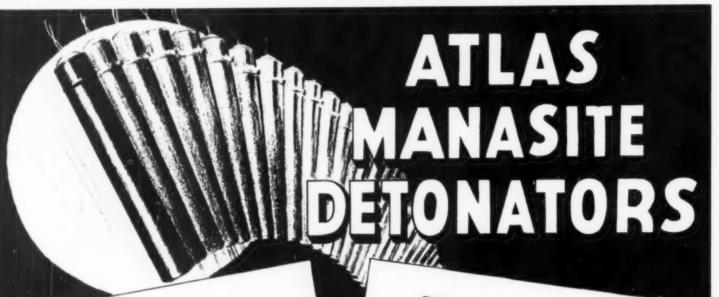
When you put a Bucyrus-Erie 120-B on your job, you know you're going to get performance that means output at bottom costs. These modern excavators have been proved for you by acceptance of leading mines and quarries all over the world. Outfits that know to a penny what it costs them to move rock and ore have tested Bucyrus - Eries thoroughly — and have

bought more of them than of all other quarry and mining shovels combined.

When your job demands a shovel or dragline to move big yardages fast and at low cost, investigate Bucyrus-Erie's complete range of modern excavating equipment. Here's a line that has been proved in the toughest digging there is!

Bucyrus Erie

SAFER-yet DEPENDABLE



GREATER SAFETY

in the way they're built

Laboratory tests and field experience prove that Atlas Manasite Detonators make safety precautions more effective than ever. Their exclusive composition reduces sensitivity to impact and friction—a big help to safety precautions.

DEPENDABLE ACTION

proved by over 50 million detonators used

In addition to the extra margin of safety, Atlas Manasite Detonators give high strength detonating efficiency. Over 50,000,000 have been used. More and more blasters are trying Atlas Manasite Detonators—and those who try them continue to use them!

Another "ATLAS FIRST

ATLAS POWDER COMPANY, WILMINGTON, DEL.

Cable Address-Atpowco

Everything for Blasting

OFFICES

Allentown, Pa. Boston, Mass. Butte, Mont. Chicago, Ill. Denver, Colo.

Houghton, Mich. Joplin, Mo. Knoxville, Tenn. Los Angeles, Calif. Memphis, Tenn.

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Spokane, Wash. St. Louis, Mo. Tamaqua, Pa. Wilkes-Barre, Pa

EXPLOSIVES





STANDARD OIL COMPANY (INDIANA)

AUTOMOTIVE ENGINEERING SERVICE

LOWERS MILEAGE COSTS

Proving the point



10 CHON 6401

SKILTON CONSTRUCTION CO.
124 NORTH FOURTH STREET
LOUISVILLE, KY.

December 27, 1939

Mr. Red Roberts c/o Penn. Dixie Cement Corp., Lexington, Kentucky

Dear Red:

Just a few words to let you know how much we appreciate your talking us into the using of Penn Dixie High Early Cement on the State Office Building Job, at Frankfort, Kentucky.

We were able to save the overhead and to gain approximately 50% of the pouring and curing time on all concrete floor slabs.

We also saved a full set of slab forms by being able to remove forms in seven days in place of fourteen to twenty-one days, as specified.

We are very much pleased in the use of the Penn Dixie High Early Gement, and ofcourse, much pleased at the saving that was effected which was approximately four times larger than the extra cost over Portland Cement.

We used approximately 6,000 Barrels on this Job, and intend to use Penn Dixie High Early Cement, wherever, possible, from now on.

Yours very truly,

SKILTON CONSTRUCTION CO.,

Geo A. Skilton, Jr.



Write now for an interesting, informative booklet E-102 sent gratis. Pennsylvania-Dixie Cement Corporation, 60 East 42nd Street, New York, N. Y. Boston-Philadelphia-Atlanta-Chattanooga-Des Moines POINT IS whenever time's a factor on any job, quick-curing, quick-use concrete made with Penn-Dixie High Early Strength Cement saves time, speeds things up cuts curing time, form costs and overhead expense.

THE STATE OF THE S

HIGH EARLY STRENGTH AND REGULAR PORTLAND CEMENTS



VV you in the face—or when you're hurrying your job to beat a break in the weather-it's comforting to know that there is one place you can turn for quick delivery on concrete reinforcing bars-your distributor of U·S·S Concrete Reinforcing Bars. Because he can "deliver the goods" when you're in a rush he's the best man to rely on for regular orders, too.

There's a U·S·S distributor near you, with ample stocks in standard sizes-ready to cut or bend bars to

billet steel bear the mark of the Concrete Reinforcing Steel Institute. When you see this mark on bars, you can be sure that they are made to high quality standards.

On that next order - assure your getting good bars and "on time" delivery-specify U·S·S.

Buy bars that bear this mark-the symbol of the Concrete Reinforcing Institute. It assures you top-quality barsrolled from new billet steel.



CONCRETE REINFORCING BARS

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago COLUMBIA STEEL COMPANY, San Francisco
TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

United States Steel Export Company, New York

UNITED STATES STEEL

TO THOSE WHO ARE INTERESTED IN PAVEMENT DURABILITY



A 2-inch TEXACO Asphaltic Concrete pavement after 29 years service on Polk Street, Topeka, Kan.



The same type of TEXACO Asphalt pavement after 29 years service on Mulvane Street, Topeka.



Both the highway engineer and the contractor constantly ask themselves and others, "How long can this piece of equipment, or this material, stand the gaff?"

Here are two 29-year-old pavements in Topeka, Kan., which throw considerable light on the durability of TEXACO Asphalt.

For almost three decades, traffic has hammered away at these Topeka pavements, aided by the stresses of ever-changing climatic conditions. Not only have the TEXACO Asphalt pavements successfully withstood this acid test of time, but they continue to give satisfactory service today. Both pavements are of the TEXACO Asphaltic Concrete type, laid to a compacted thickness of two inches.

To the engineer, long-lived TEXACO Asphalt pavements such as these mean an attractively low annual cost. To the contractor, long-lived TEXACO Asphalt pavements are a sound basis on which to build a reputation for good workmanship.

TEXACO ASPHALT

THE TEXAS COMPANY, Asphalt Sales Dept., 135 East 42nd Street, New York City

Chicago

Philadelphia

Houston

Buffalo

Kansas City

Boston

Richmond

Cleveland

Jacksonville

NO LOST MOTION



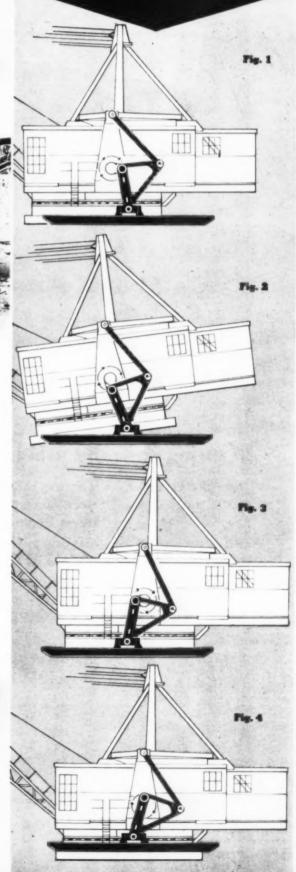




THE NEW MARION WALKER readily demonstrates its advantages to the contractor working in soft, marshy ground in the MARION walking principle diagram shown at the right. To move the MARION WALKER the shoes are brought into contact with the ground (see Fig. 1). The continued clockwise rotation of the shaft causes the shoes to build up ground pressure (see Fig. 2), moving the base slightly backward to break the ground pressure before the forward movement. The base has now moved forward (see Fig. 3), is on the ground, and in Fig. 4 we see the walking shoes in their resting position. • As a result of this improved principle of walking, the MARION WALKER will continue to advance by rapidly concurring steps as long as the propelling shaft rotates. There are numerous other features that invite your investigation. Write for catalog.

THE MARION STEAM SHOVEL CO. . Marion, Ohio, U. S. A.

MARION WALKER





How a contractor cut job time in half, saved \$200 in curing costs, by using Atlas High-Early Cement!

THE JOB: To drive piles during the winter for the East Street Sludge Disposal Plant, New Haven, Conn. THE PROBLEM: After driving pile shells and filling with concrete, the contractor could not drive additional piles nearby until the newly placed concrete gained enough strength to withstand vibration. Naturally, this tie-up would have meant time and money lost.

THE SOLUTION: The contractor decided to use Atlas High-Early cement. He placed concrete, made with Atlas High-Early, in the driven shells at the end of the day. Result! This concrete gained such strength overnight that the contractor could drive piles close by—the next day! Thus, he estimates, the use of Atlas High-Early saved 10 days on an otherwise 20-day job... and—in addition—saved

\$20 a day—or \$200—on curing costs!

A SAVING LIKE THIS on time and curing costs usually pays over and over again for the slightly higher cost of Atlas High-Early cement. If you want to see how this easily workable, fast-setting cement can help you rush through rush jobs... and how it can help you cut costs on many types of concreting work, try it out on your next job! Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Chrysler Building, New York City.

СМ-Н-8



Atlas High-Early Cement

A UNIVERSAL ATLAS PRODUCT

Construction Methods

ROBERT K. TOMLIN. Editor

Volume 22

MARCH, 1940

Number 3

Plywood Sheathing **SPEEDS ERECTION OF** AIR CORPS BUILDING

wood has been specified as combination sheathing and siding. March Field is one of a number of fields where this type of construction is in progress. As an alternate, %s-in. plywood also can be used as roof sheathing, and a number of contractors have chosen to employ it.

COMBINATION SHEATHING AND SIDING of ex terior grade Douglas fir plywood is attached to wood frame lying flat on floor

HIGH-SPEED CONSTRUCTION with Douglas fir plywood sheathing featured the erection of new buildings by Escherich Bros., contractors, Los Angeles, Calif., to house increased personnel of the Army Air Corps at March Field, Calif. Large wall sections were framed and sheathed in flat position on the floor and were raised into vertical position by carpenters and helpers as illustrated in an accompanying photograph.

For the entire expansion program of the Army Air Corps, involving 286 barracks, 62 recreation buildings and 53



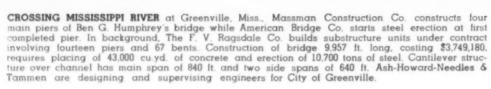


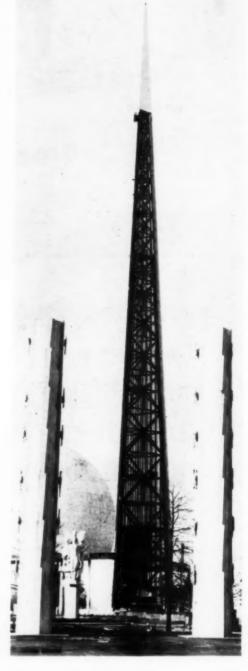
March 1940 - CONSTRUCTION METHODS



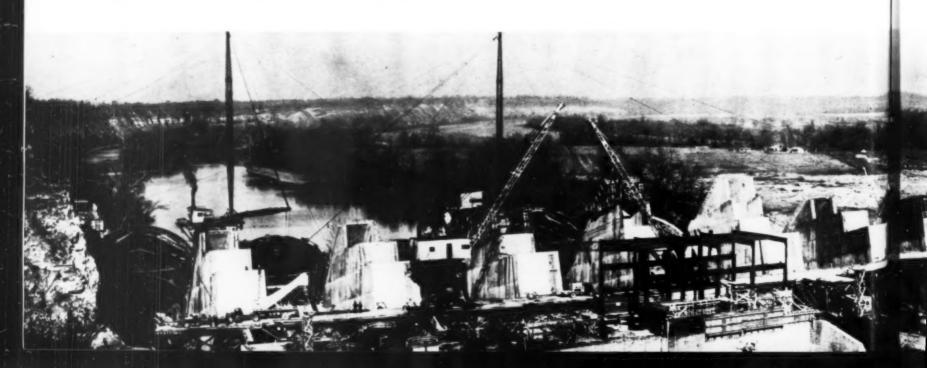








stripped of stucco facing below 125-ft. metal cap, steel frame and studs of 635-ft. Trylon at New York World's Fair are ready for application of plywood sheathing by J. A. J. Construction Co., contractor, Brooklyn, in preparation for opening of Fair's second year, May 11.





OPENING OF ROAD SHOW in International Ampitheatre, Chicago, Jan. 29, is signalized by address by Murray D. Van Wagoner, president of American Road Builders' Association and State Highway Commissioner of Michigan. Grouped about the speaker are (left to right) Congressmen J. W. Robinston, of Utah, and Jennings Randolph, of West Virginia, Col. Willard Chevalier, past-president of the A. R. B. A., and Congressman Wilburn Cartwright, of Oklahoma, chairman of the House Committee on Roads.

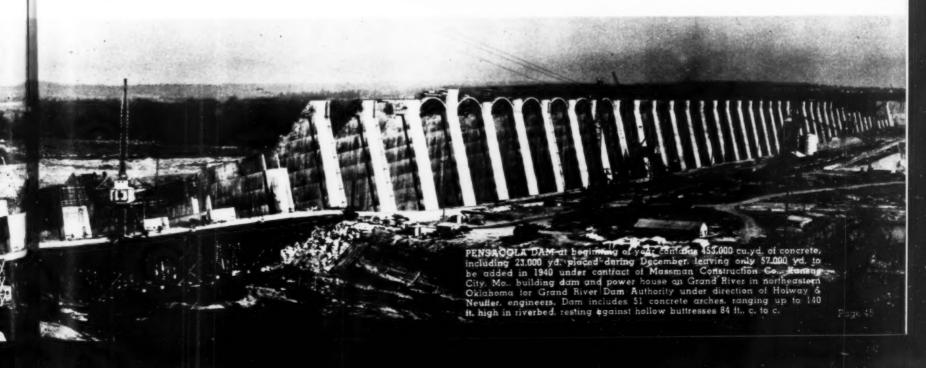


1940 ROAD SHOW, held Jan. 29-Feb. 2 in conjunction with thirty-seventh annual convention of American Road Builders' Association, fills 8 acres of floor space in International Ampitheatre Chicago, with equipment exhibits of 250 manufacturers which drew attendance of 40,000 highway engineers and contractors, government, state, county and city officials, equipment distributors and representatives of makers of machinery and materials. Heavy equipment on display included latest models of power shovels, cranes, tractors, scrapers, wagons, rollers, air compressors and air tools, graders, concrete mixers, trucks, diesel and gas engines, in addition to displays of paving materials.



FIRST OF SEVEN TUNNELS to be holed through on Pennsylvania Turnpike in Rays Hill bore, started in 1885 for South Penn R. R. by Mason & Hanger, contractors, New York, and now being completed by same firm for Turnpike Commission as one link in \$70,000,000 express toll highway between Harrisburg and Pittsburgh. Shaking hands through opening are Samuel W. Marshall (left), chief engineer for Turnpike Commission, and Richard M. Merriman, chief tunnel engineer, while C. E. May resident engineer, looks on.

THIS MONTH'S ENEWS BEEL



THE FALL OF The House of Russia



SPECIAL REFINEMENTS, not ordinarily associated with building wreckers' methods, marked high-speed winter demolition of the Soviet Pavilion at the New York World's Fair, where the Albert A. Volk Co., contractor, New York, exercised skill and finesse in salvaging 5,000 tons of materials for shipment to Russia and eventual re-assembly in that country. Of the salvaged materials, 1,700 tons was structural steel, and the remaining 3,300 tons represented valuable statuary, bas reliefs, stone, marble, metal and mechanical equipment which had to be carefully packed in thousands of marked crates and cases. A short contract time of 74 calendar days, running through the coldest part of the winter from Dec. 18 to Feb. 29, with a penalty of \$500 a day for non-completion, was specified to meet requirements of the Fair Corporation, leaving a little more than two months available to reconstruct the cleared site prior to the opening of the Fair's second year on May 11. Salvaging and packing operations accordingly had to be geared to a fast demolition schedule which called for efficient and ingenious methods of dismantling the structure, particularly in removing a 79-ft. stainless steel statue which stood on a 180-ft. pylon.

Monumental Building

Because the Soviet Pavilion was designed for removal and re-erection on a permanent site, it was greatly superior to temporary Fair buildings in the quality and character of its construction. Semicircular in plan, with the tall py-

GIN POLE (left) lifts head of stainless steel statue after interior steel framing connections have been unbolted and exterior welded joint has been cut.



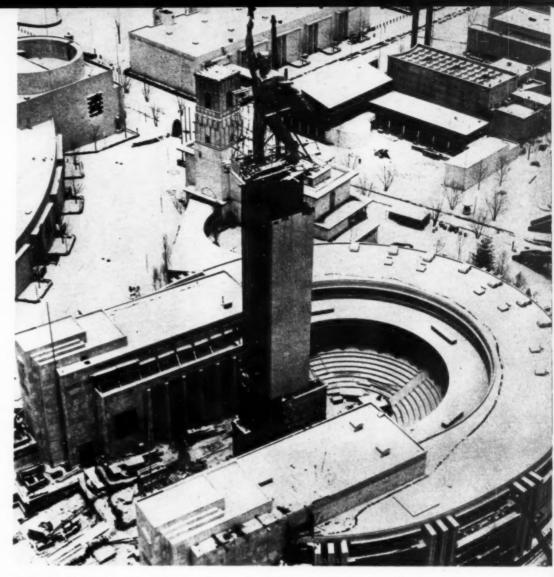
DEMOLITION PROGRAM is directed for Albert A.Volk Co. by MICHAEL SHERIFF (left), treasurer, and A. K. FLESCHNER, president.

ion and an amphitheatre in its central court, the main pavilion covered 75,000 sq.ft. and housed an exhibition area of 53,000 sq.ft. Interior and exterior walls were faced with about 800 tons of marble in nine varieties, quarried in the Soviet Union and shipped to this country for cutting and erection against cinder concrete block backing. Glass blocks, plate glass and decorative metals were used extensively in the structure, and the building was equipped with elevators, escalators and a complete air conditioning system. Tempory elements of the pavilion, not intended for re-use, consisted of stuccoed walls on gypsum board sheathing attached to wood studs and of built-up roofing over wooden decking on timber joists.

Precast concrete statuary groups and bas reliefs presented serious problems to the demolition contractor. The statuary groups originally had been assembled from precast segments, and it was necessary for the contractor to separate the groups into the original sections to facilitate packing and shipment. This work required the greatest skill and care to prevent irreparable damage to the statuary.

Eleven huge bas reliefs of precast concrete set into the outside wall of the pavilion likewise had to be separated into their original sections with extreme care. Other bas reliefs of cut stone, weighing up to 14 tons each, called for skillful rigging and handling to effect their safe removal.

Inside the building, all exhibition



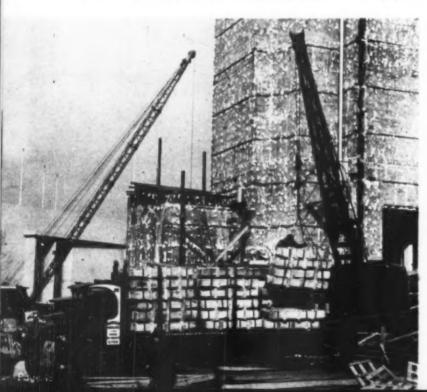
CAREFUL DEMOLITION of Soviet Pavilion at New York World's Fair proceeds on fast schedule during coldest months of winter. On platform at top of tall central pylon, small derrick has erected steel gin pole to dismantle 79-ft. stainless steel statue representing Soviet workman.

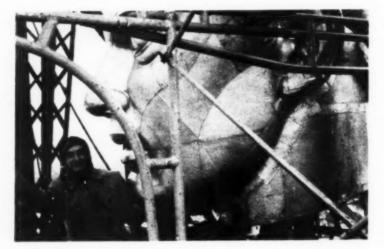




COOLING TOWER of air conditioning system is dismantled and removed from exposed portion of building by manufacturer, operating under separate contract. Crates and cases are on hand for packing salvaged materials, including 100 tons of sheet metal ductwork. Glass block panels are taken down by truck cranes and are crated in solid units.

THOUSANDS OF CRATES AND CASES (below) handled by truck cranes are used in packing 3,300 tons of valuable materials and equipment.

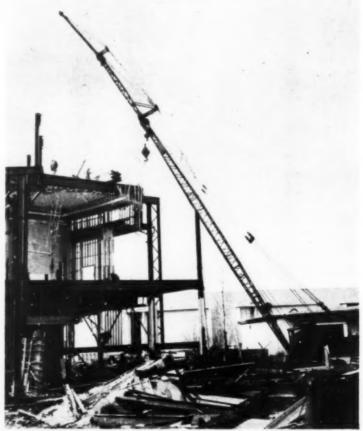




STAINLESS STEEL HEAD of fabricated sheet metal statue is detached from body under obsérvation of Charles Fleschner, secretary, Albert A. Volk Co.



 $\begin{tabular}{lll} \textbf{PRECAST CONCRETE STATUARY GROUP} is separated into original sections to facilitate safe packing and shipping. \end{tabular}$



CRAWLER CRANE carrying long jib on wall boom removes structural members from one wing of pavilion.

items except three heavy sculptured statues had been taken out by the owner prior to the start of demolition. The three statues, weighing up to 20 tons, were left for handling by the demolition contractor.

Lump Sum Bid

In preparing a bid for a demolition job which involved extensive salvaging of materials, quantities had to be taken from plans with almost as much care as in bidding a building construction project. Original plans were available for this work; some changes in design had been made during construction, but these changes were visible to the estimators. The entire job, including all operations from demolition to packing and loading on trucks, was awarded on a lump sum basis.

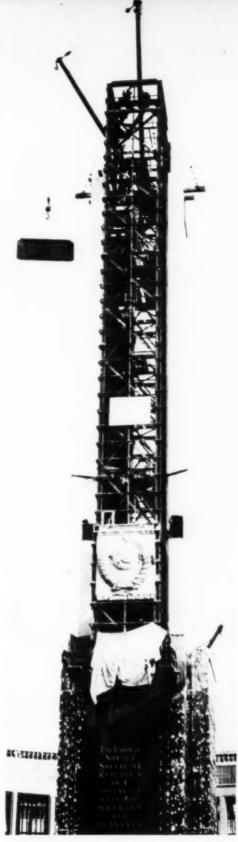
On irreplaceable statuary and bas reliefs of metal, cut stone and precast concrete the contract set cash values running up to \$50,000 per unit, which the owner could recover from the contractor in case of serious damage. For fragile, replaceable materials, the contract allowed a certain percentage of breakage. In the case of glass and marble, for example, the allowance was 10 per cent for glass and 3 per cent for marble. The contractor was able to work within the permissible limits on glass, and on marble the breakage was practically nil.

On advice from the principal contractor, the commissioner in charge of the work for the owner made separate agreements covering removal of elevators, escalators and air conditioning equipment with the companies which originally had installed them, the Otis Elevator Co. and the York Ice Machine Co. To avoid any uncertainty regarding responsibility for completing the work on schedule, the principal contractor was made responsible for completion of their jobs on time by the separate contractors.

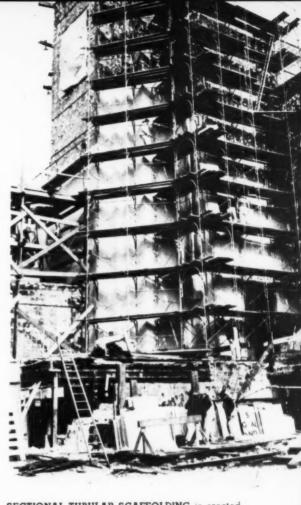
In general, the demolition plan called first for removal of valuable statuary, decorations, materials and equipment

(Continued on page 113)

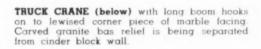
AFTER CUTTING SWATH (below) through center of semicircular pavilion, crawler crane proceeds with dismantling steel in one wing.

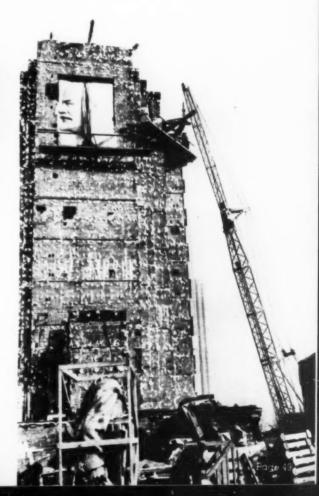


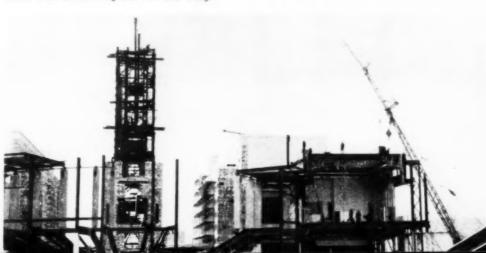
GUY DERRICK set into frame of pylon dismantles and lowers steel members. Derrick is jumped down inside frame as demolition proceeds. Red quartzite facing has been stripped from pylon by marble setters working on hanging scaffolds and has been lowered on improvised platform hoist inside steel frame.



SECTIONAL TUBULAR SCAFFOLDING is erected alongside exterior walls to permit stripping of marble. Contractor removes 800 tons of marble and packs it in 5,000 crates with breakage of less than one-tenth of 1 per cent.







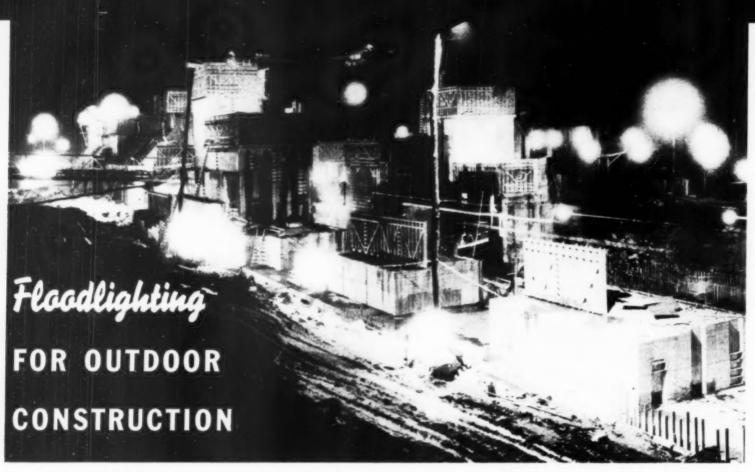


Fig 1 CENTRALIZED SYSTEM of illumination for night work at Chickamauga dam in Tennessee utilizes floodlight projectors more or less permanently located near source of power

By GEORGE A. EDDY Illuminating Laboratory, General Electric Co., Schenectady, N.Y.

THE CONSTRUCTOR SOMETIMES FINDS that it would be to his advantage if only he could keep a certain job progressing during the night as well as the day. Floodlighting is the solution to his problem, but in planning his installation he must consider three factors: accuracy, speed and safety. Lighting must be adequate for prevention of errors, it must allow speedy work and it must assure safety to the workmen.

Correctly designed and scientifically installed floodlights are proving to be a real economy to many contractors. When a job must be rushed in order to meet a contract time limit, adequate lighting permits a considerable increase in progress. In some cases work actually moves faster at night than during the day—there is less traffic. Then, too, is should be considered that

(Continued on page 118)

Fig 2 ... TYPICAL FORMS OF FLOODLIGHTS suited to construction operations at night. (A) Copper housing, silvered glass mirror, 1,000 watts. (B) Alzak finished aluminum housing and reflector, 1,500 watts. (C) An 18-in. searchlight with Alzak finished aluminum housing and reflector, 1,000-1,500 watts. (D and E) Porcelainenameled steel, 300—1,500 watts.















FOLDED FOR PORT-ABILITY, 32-lb. volumeter makes convenient package 4½ in. wide by 4 ft. long.



Subgrade Gaging Templet MEASURES PAVEMENT VOLUME

A MEASURING DEVICE for determining pavement volume prior to placing of concrete has given accurate results on tests by the California Division of Highways Designed by C. Wilczek to indicate volumes on a dial, the instrument comprises a folding metal box equipped

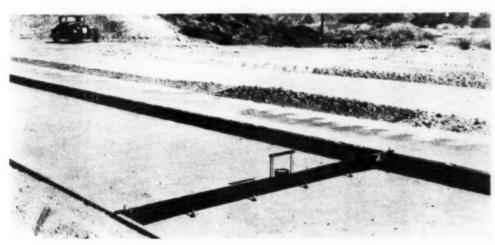
with movable plungers which make contact with the subgrade and actuate a mechanism controlling the dial's hands. When unfolded for use, the box is placed with header bars at both ends resting on the side forms and with the feet of the plungers in contact with the subgrade. Volume of concrete for a specific length of slab is read on the dial, and variations of subgrade are indicated by colored stripes on the tops of the plungers.

Registering Dial — Known as a volumeter (or, colloquially, as a subgrade stabber), the device carries a horizontal dial on the top center of the light metal box. On the dial are three concentric circles of figures from which the volume in cubic yards per 20-ft. length of pavement is read. Allowable pay limits of pavement are between normal subgrade and 0.02 ft. low. Each circle on the dial represents the pavement volume involved in 0.02 ft. of average subgrade variation, making it possible to read volumes between 0.02 ft. above and 0.04 ft. below normal subgrade.

Within the inner dial circle are two



DIAL READS NORMAL in this instance, as indicated by small white hands radiating from diametrically opposite points inside dial circle. Pointer at left shows that quantity is to be read from middle of three large circles on dial, and figure in this circle indicated by main hand gives 4.78 cu.yd. as volume to be placed on normal subgrade in 20 ft. of pavement of California Division of Highways design.



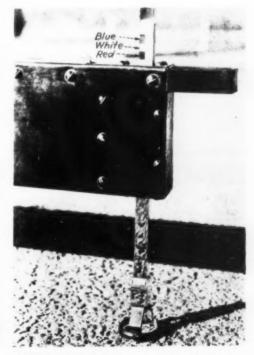
WITH HEADER BARS at two ends of volumeter resting on side forms, movable plungers in contact with subgrade actuate registering dial which indicates volume of pavement to be placed in 20 ft of road.

small arcs radiating from points diametrically opposite, as shown in an accompanying photograph. The left arc is divided into three sections which are correlated with the three volume circles. A small hand which points to these sections indicates the circle to be read for volume. The opposite arc, on the right, is graduated to give the average variation of subgrade, above or below normal between +0.03 ft. and -0.07 ft. A small hand points to the proper reading.

Box Body — Unfolded for operation, the volumeter box is 1½ in. wide by 4½ in. deep by 10 ft. 11½ in. in length, for use on 11-ft. lanes. For transportation it folds readily into a parcel 4½ in. wide by 4 ft. long, fitting conveniently into an automobile. Weight of the apparatus is about 32 lb. The metal box provides rigidity and houses the actuating mechanism which connects the movable plungers with the registering dial. Six movable plungers are mounted vertically through the body and are spaced about 2 ft. apart.

Adjustments are simple. The plungers may be locked in normal position, corresponding to normal subgrade, and the dial made to read normal by a wing nut adjustment.

Test Results — Tests by the California Division of Highways have indicated an average variation of less than 0.06 of 1 per cent in quantities obtained by operating a volumeter in two directions over short portions of subgrade chosen at random. It is claimed that the device eliminates the personal factor in subgrade measurement.



MOVABLE PLUNGER has ring foot which bridges small holes in subgrade and offers limited bearing on pebbles. For sand subgrade, removable sand plates are substituted. Strips at top indicate: (1) red, grade too high; (2) white, pay limits between normal and 0.20 ft. low; (3) blue, between 0.02 and 0.04 ft. low.

Proving Ground TESTS TRUCKS UNDER SEVERE CONDITIONS

for trucks, a modernized and expanded proving ground at the Fort Wayne, Ind., works of the International Harvester Co. has been in constant use since November testing the company's motor haulage vehicles. The new proving ground offers every facility except hilly country required in the complete test program.

An oval concrete track 6,200 ft. in length enables truck drivers to pile up high mileages at constant speeds and thus expedite the test program for each vehicle. As driving tests are conducted on 24-hr. schedules, the entire track is equipped with luminous road markers to assist the drivers. Straightaway sections of the track are 25 ft. wide, and the banked turns are 35 ft. in width. Inside the oval are three turning circles and two steering courses.



FRONT WHEELS LEAVE ROAD SURFACE as operator drives loaded truck over Belgian block pavement at "critical speed". Driving 500 mi on this road at predetermined speed brings out any detection chassis, cab or sheet metal construction.

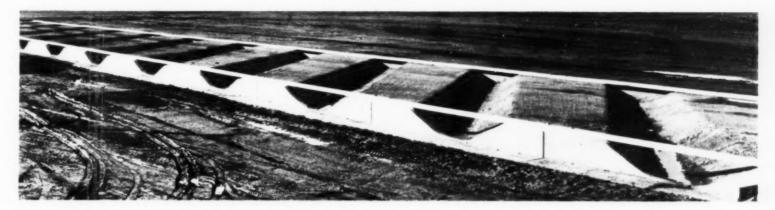
the concrete pavement and just inside it is a stretch of highway paved with Belgian blocks to test trucks on rough pavement similar to that frequently encountered in large cities.

In testing chassis and sheet metal parts, trucks are driven at predetermined "critical speeds" for many hundreds of miles over this road.

A mud, water and sand bath, built as a section of the concrete track, but just inside it, supplies many of the hazards which trucks often meet in actual hauling operations. Trucks being tested on



TWISTED FORE AND AFT as front and rear wheels on opposite sides of vehicle drop into diagonal depression, loaded truck undergoes severe stresses in chassis and cab.



"TWIST COURSE" comprising series of diagonal depressions ranging in depth from 19 in. at one side to 12 in. at other provides severe test for trucks driven over it at slow speed.

the track are driven at stated intervals through the water, sand and mud to determine the effect on vital mechanical parts.

One of the most severe tests which all trucks go through in the experimental program is on the "twist course," a unique truck testing feature located near the center of the space inside the track. The surface of this section of road consists of deep corrugations from 12 to 19 in. deep constructed at 45- deg. angles across the road. This design furnishes the most difficult test engineers have been able to devise for producing stresses and strains in truck chassis, cab and sheet metal parts. The four wheels of a truck meet the recessions and protrusions in the twist course at different times and at different angles, thus providing maximum punishment for the truck chassis.

In the large area inside the oval con-

(Continued on page 113)



BATHTUB SECTION enables engineers to study effect of sand, mud and water on mechanical parts



DIVISIONAL ISLANDS to guide interchanging traffic and median barriers to separate lanes on highways are features of channelization at intersection in Oakland, Calif.

Channelization GUIDES TRAFFIC AT INTERCHANGE

TO KEEP TRAFFIC in its proper lanes and avoid unexpected turns by drivers passing from one highway to another at an important intersection having separated grades, Oakland, Calif., in collaboration with the State Division of Highways has built a channelization system utilizing connecting curbs between triangular deflector islands where Broadway (state highway 75) crosses under Landvale St. (state highway 206). In addition, channel curbs are used on the highways to separate traffic into the proper lanes in advance of the turning points and to prevent left turns where these turns are prohibited. Safety fea-

(Continued on page 122)

Standardized Calle FOR OPERATING **SCRAPERS** IMPROVES SERVICE ON JOB

By KENNETH F. PARK Chief Field Engineer, R. G. Le Tourneau, Inc. Peoria, Ill.

POWER-CONTROL UNIT with two cable-drums for operating Carryall scraper is mounted on rear end of tractor. Unit is standardized as to size, cable-drums and sheaves for 4,000-lb. cable pull. Sheaves have grooved center disk of alloy steel resistant to cable wear. Pivoted housing allows sheaves to swing, aligning cable and eliminating binding on sides of grooves.

BY USING CABLE for operating scrapers, bulldozers, rooters, power-control units and other tools of our manufacture, we obtain the high flexibility that is so desirable in equipment of this kind, which must be operated out-of-doors under every conceivable condition of heat, cold, dust, rain, ice and snow. Bad atmospheric conditions, added to the high loads carried, are severe on the operating cables. Hence, we have given careful consideration to the selection of cable and the designing of sheaves and drums for these tools.

After trying various types and constructions of cable in different sizes, we decided that the best steel cable obtainable should be used for this service, since the longer life obtained, with less frequent end-cropping and cable replacement, would more than compensate for the higher initial cost. Accordingly, we selected high-strength cable, of improved plow steel, 6x19 construction.

Cable Size Standardized

Since loads varied, we had the choice of increasing the cable diameter to handle higher capacities or of standardizing on one size of cable and using a system of sheaves to obtain the desired number of cable parts for multiplying the pull of the cable. For example, a four-fold increase in load could be handled by using four times as many cable parts, without changing the cable size. Or it could be obtained by using the same number of cable parts but doubling the cable diameter, which would require drums and sheaves of twice their original diameters and heavier bearings. The supports of sheaves and drums also would have to be made of greater section. The increased rope diameter and drum size would also require a torque on the drum axle eight times the original torque.

After considering all these factors, we decided that the advantages of constant cable size with variable number of cable parts far outweighed the advantages of the other method. Moreover. important to us as well as our customers was the fact that a single standard cable size and construction requires only one cable size to be carried in stock, thereby reducing inventory, lessening the possibility of making a wrong cable application, and simplifying requisitioning and replacing of cable. Hence, we standardized on ½-in. cable, with independent wire-rope center. With a rated 4,000-lb. pull (with bare drum) on the cable, this gives a factor of safety of over 51/2, which is generous for this

class of work.

Standardized Power-Control Unit

The use of only one size of cable also allowed a standardizing of the powercontrol unit, including the gear reduction, brake, cable drums and sheaves. The same power-control unit, therefore, may be applied to virtually all our tools, regardless of capacity, since, with few exceptions, they are designed for a 4,000-lb. cable pull. Moreover, sheaves being standardized as to size, we were able to reduce their unit manufacturing costs and to keep on hand a smaller stock than would be required if many sizes were used.

When sheaves increase in size they

in preformed cable are formed to their final shape and then laid in place in the process of assembling the cable. Hence, preformed cable has virtually no internal stresses; it lies straight and feeds over sheaves with much the same smoothness as manila rope.

Another reason for selecting preformed rope was its high resistance to fatigue stresses. When sheaves and in the tailgate forward cable occurs in the first 20 to 30 ft. at the power unit end of the cable. This part of the cable is subjected to almost continuous operation over the drum and sheaves of the power-control unit. By frequently cutting off 20 to 30 ft. of cable at the drum end further service may be obtained from the remaining cable. The destroyed length of cable is compensated for by



WIRE ROPE CABLE of standardized 1/2-in. diameter, preformed, Lang-lay construction operates 12-cu.yd. Carryall scraper through 32 sheaves having uniform tread diameter of 91/2 in.

not only require more space and add to the weight of the equipment, but they increase in cost, require larger bearings, and the greater inertia that must be overcome means greater power consumption and greater wear on the cable. For all these reasons, but chiefly because of space and weight considerations, we desired to keep the sheaves as small as practicable. So we standardized on a sheave with a 91/2-in. tread diameter, thus giving a sheave-to-cable-diameter ratio of 19 to 1, which is quite low for cable as inflexible as ordinary 6x19 construction. By choosing Langlay construction, however, instead of ordinary lay, we obtained a more flexible cable.

Preformed Wire Rope Chosen

We then went a step further and standardized on preformed wire rope construction. Lang-lay cable is cranky and hard to handle when non-preformed. With non-preformed cable, each wire is forced or twisted into position in the strand, and the strand forced into position in the rope, thereby setting up internal stresses that try to relieve themselves by forming kinks in the cable, or in some other manner, thus producing the wavy appearance of new cable when unwound from the spool. On the other hand, the individual wires and strands

drums are small, fatigue breaks develop quickly in the cable wires, particularly if the cable is non-preformed. Our experience with both preformed and non-preformed cable operating over sheaves and drums, is that the preformed gives much longer life. The wire-rope center gives a construction that resists the crushing action of the top layers on the bottom layers when being reeved on the drum. The 9½-in. sheaves and the 6x19 Lang-lay preformed cable, with independent wire-rope center, meet the requirements of our tools in a satisfactory manner.

The number of sheaves employed depends on the kind of tool and its capacity. In our single-bucket 12-yd. Carryall scraper, built for general earth-moving service, thirty-two 9½-in. sheaves are used. This machine is operated by two cables, controlled from one of our power units provided with cable drums and sheaves and equipped with gear reducer, brake, and clutch.

The power-control unit, which controls the cable for all our cable-operated tools, has two cable drums, the standard drum being $7^{5/8}$ in. in diameter and $7^{5/8}$ in. long, with a capacity of 186 ft. of $^{1/2}$ -in. cable. Each cable feeds from its drum to a spooling sheave, then to a lead sheave, and from there to the scraper or other machine.

The greatest amount of deterioration

unreeling the same amount of cable from a storage drum, which carries a considerable length of surplus cable at the anchored end. The cable is simply unclamped at the dead end, the required length is unreeled from the storage drum, and the cable is again clamped. This operation shifts every wear point in the cable a distance toward the power unit equal to the amount cropped off at the power unit end, and brings other portions of the cable to the main wearing points. Thus, cable life is increased by distributing the wear more uniformly over the length of the cable.

Operating Hints

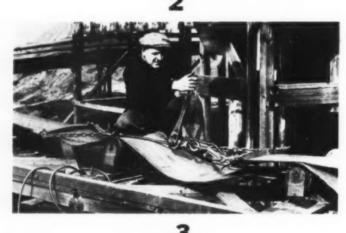
A good operator may obtain two or three times as much life from a cable as a careless operator. The manner in which the equipment is handled has an important bearing on cable life. When traveling over uneven ground or making a turn, the changed position of the power unit with respect to the scraper or other tool may cause a pull on the cable. If too much cable has been reeled in on the drum, so there is little or no clearance between the pushbeam stops, or the scraper tailgate is in its extreme forward position, the result may be a straining or breaking of the cable. The

(Continued on page 122)

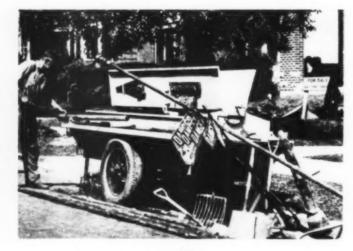














1 TAMPING OF BACKFILL in trench.
cut through street pavement is done
with air-operated Chicago Pneumatic
tools. Overall length of tamper is 50
in. Models striking from 700 to 800
blows per minute range in weight from
26 to 40 lb. Aluminum butt has 5-in
diameter.

PORTABLE POWER PLANT, a 3-hp Mall gasoline unit, operates, through flexible shaft, grinder for finishing concrete surfaces by removing form marks and fins. Machine has two-speed countershaft and can operate concrete vibrator as well as grinder. High-speed and low-speed spindles are available for dry and wet surface finishing

3 CONVEYOR BELT IS TIGHTENED with aid of Coffing ¾-ton safety-pull hoist, weighing 14 lb. and operating on ratchet-and-pawl principle. Load is always locked by sprocket and ratchet pawls. Device has lift of 56½ in

for pulling wire through conduits Ideal fish tape reel and puller makes job easy. Reel furnishes sure grip and allows electrician to exert full strength, eliminating hazards from use of pliers that may slip.

5 ALL-STEEL TOOL BOX of trailer type is mounted on pneumatic-tired wheels for easy mobility. Interior of Littleford unit contains compartments of various sizes for orderly storage of tools and cover may be locked to prevent theft of contents. Side shelves provide work bench on job and a place to carry pipe in transit. Wheels and tires lock from inside

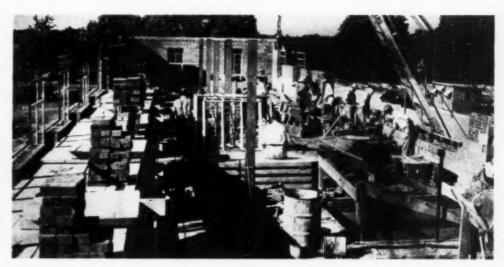
6 A MORTISE A MINUTE is claimed for this Stanley (R L. Carter Division) door lock mortiser powered by electric motor, machine is designed to feed automatically to proper depth and stop.

4

5



GASOLINE-POWERED CIRCULAR SAW, 16-in. diameter, cuts plaster grounds and performs innumerable other services for carpenters on housing job. (De Witt saw, Le Roi engine.)



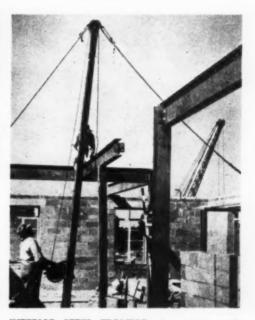
MASONS' TOOLS' scaffolds, hods and wheelbarrows play important parts in laying face brick and lightweight backup block in exterior walls.

Hand Tools ASSIST MECHANICS ON MID-WEST HOUSING PROJECT

IN ERECTING a \$1,500,000 private rental housing project financed by FHA mortgage money at Marcy Village, Indianapolis, Ind., E. A. Carson, builder, of the same city, employed all trades except plumbing, heating and electrical, which were let out by subcontract, and equipped his crews with hand tools and power tools to cut the cost of construction. The project includes nineteen two-story wall-bearing apartment houses containing 277 living units of 1,093 rooms, plus sixteen garages for eight cars each and a store building with rooms for five stores.



IN EFFORT to develop feasible portable power tool for cutting numerous off-size gypsum blocks needed to close openings between building units, contractor tests electric saw fitted with 12-in. abrasive disk and held in inverted position such as it would occupy in small table which could be moved readily from one partition closure to another inside buildings. Saw performs satisfactorily in cutting 3-in. block held by C. E. Bell, field superintendent, but P. R. Alexander, general superintendent, reports some trouble from dust filtering into electric motor.



INTERIOR STEEL FRAMING of masonry wall-bearing buildings is erected by hand-operated derrick. (Sasgen.)



RIGGED FOR BENCH USE, bolt cutter (H. K Porter) severs rods and bolts up to ½-in. diameter



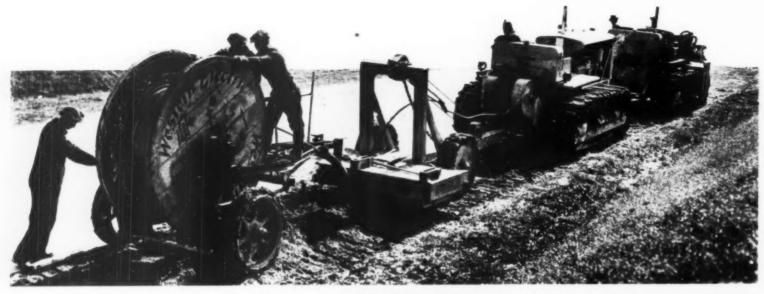
GYPSUM SAWS (Atkins) reduce dimensions of 4-in. block to fit closures in interior partitions Openings are maintained through 8-in. firewalls between building units to facilitate passage during construction.



SAW STAND assists saw sharpener in setting and sharpening teeth of gypsum saws



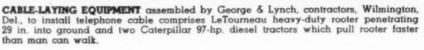
PORTABLE ELECTRIC CIRCULAR SAW equipped with 8-in. blade (Skilsaw) rips 2-in. joist Same saw cuts dressed lumber up to 3-in. size



They Did It

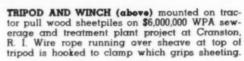
CONSTRUCTION DETAILS

For Superintendents and Foremen





RIVET-GUN VIBRATOR (below) welded to batch hopper shakes down dry materials to charge dual-drum mixer in concrete plant of West Construction Co. for lining two ½-mi. tunnels of railroad relocation around Shasta Dam, Calif.

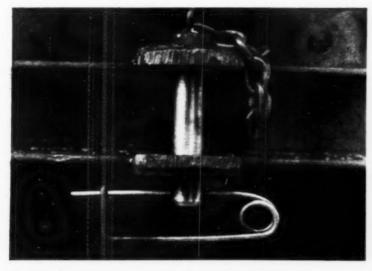




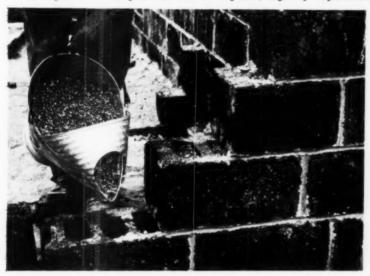
PIPE-ALIGNING CLAMP holds tubing properly spaced in position for welding. Device consists of welded V-shaped trough with two improvised C-clamps welded to it. Chain clamps, with threaded eye-bolt adjustment for final tightening, can be substituted for C-clamps.



FOR BETTER WIRE ROPE INSPECTION, flat marlinspike devised by T. H. GRAY (left), gantry operator, and held by DAN S. GOODBODY, engineer, American Concrete & Steel Pipe Co., on Boston aqueduct contract, can be used with proper care to separate strands of preformed rope down to core without damage. Made of manganese steel to resist nicks, device has handle 8 in. long by ½ in. in diameter; spike 12 in. long tapers to point from width of 3/16 in. at handle.



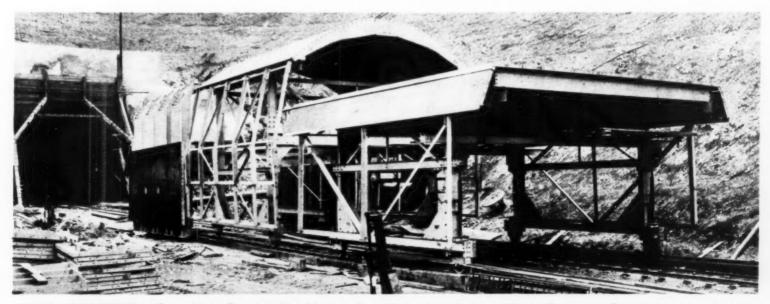
SAFETY PIN used by District 18, Texas Highway Department, prevents trailer hitch from jarring loose, thus avoiding accidents caused by trailing unit's breaking away from truck. As safety pin is not attached in any way to coupling, operator must of necessity always replace it in coupling pin, according to M. B. Hodges, maintenance engineer, Highway Department.



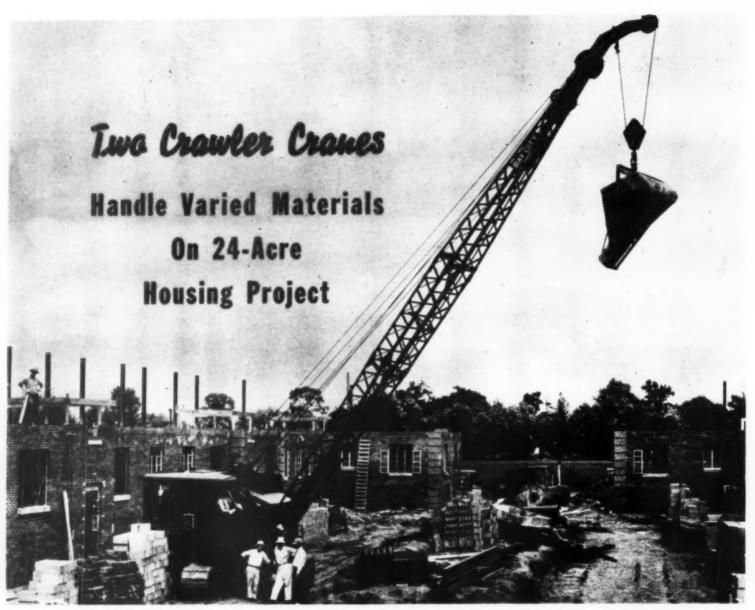
GRANULAR INSULATING FILL for cores of hollow concrete masonry units, as recommended by Portland Cement Association, may be applied readily by coal-scuttle type of container. Principal types of granulated insulation include Vermiculite, an expanded, extoliated mica; regranulated cork; expanded slag, such as Waylite, Superock and Pottsco; dry cinders; and Haydite. Cinders, it is pointed out, probably will not give as good insulation value as the other materials.



WELL-POINTS keep trench in sandy soil dry and eliminate need for sheeting on 30-mi. line of 46-in. diameter Lock Joint precast concrete pipe for new \$4,100,000 water supply at Grand Rapids, Mich. Three pipe-laying crews each use 1,000 ft. of header pipe to which Griffin well-points are connected along line excavated by Marion and Northwest pull shovels. Well-points of 2-in. pipe are jetted down to depths of 14-16 ft., or about 2 ft. below bottom of trench. Contractors for two sections of pipe line are Fry & Kain, of Lansing, Mich., and Price Bros., of Dayton, Ohio.



TUNNEL LINING FORMS for Pennsylvania Turnpike's Blue Mountain Tunnel, being driven by Bates & Rogers Construction Co. in conjunction with adjacent Kitatinny tunnel, are supplied by Blaw-Knox Co. in units to serve three stages of lining: sidewalls, arch and ceiling. Sidewall forms are non-telescopic, only one set to be used at a time; but arch and ceiling forms are telescopic to permit alternating two sets. To reduce deviation of finished concrete from true plane surface, forms are 50 per cent heavier and stronger than those used for ordinary construction.



GOOSENECK TIP on 50-ft. boom of 20-ton crane handles ready-mixed concrete in 11/4-yd. bucket for floor and roof slabs.

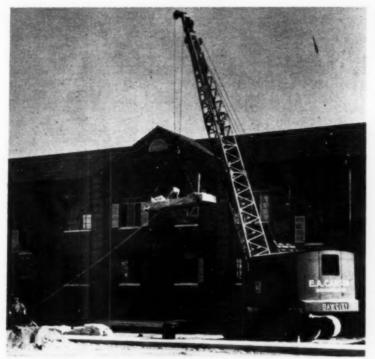


BUILDING OPERATIONS are directed for E. A. Carson by PEARL R. ALEXANDER, superintendent.

SERVING EVERY VARIETY of materialhandling requirement at Marcy Village, a \$1,500,000 private housing project built by E. A. Carson in Indianapolis, Ind., two crawler cranes with 50-ft. booms hoisted and swung into position the bulk of the concrete, brick, mortar, backup and partition block, bar trusses and structural steel for nineteen twostory apartment houses and auxiliary buildings on a 24-acre site. Agile, flexible service by the two self-propelled cranes eliminated need for any other type of hoisting equipment. Relatively narrow width of the buildings, ranging to 31 ft. 8 in., permitted the larger crane, a newly purchased 20-ton Bay City machine with a 5-ft. gooseneck on its 50-ft. boom, to place concrete directly from a bucket on floor and roof slabs. In handling other materials, the larger machine was capably supplemented by a rented Koehring crane of about 12ton capacity. Between them, the two cranes kept the construction crews well supplied with materials, even when the job's payroll was at its peak of 400 men.



CONSTRUCTION CREWS work under supervision of CHARLES E. BELL field superintendent.



GYPSUM CEMENT PLASTER for interior walls rides in material-handling box on load line of gooseneck crane to chute at second-story window, where workman slides sacks to laborers inside building.



In addition to the nineteen two-story apartment buildings, inclosing 231,000 sq.ft. of floor area, the project includes sixteen eight-car garages and a store building with space for five stores. Total land coverage by buildings is 146,700 sq.ft.

Apartment buildings have full basements with 12-in. concrete block walls on 12x24-in. concrete footings in gravelly clay soil. The superstructures of these two-story buildings are of fire-resistant construction with load-bearing masonry exterior walls made up of 4-in. face brick and 8-in. Haydite backup block. Width of the buildings between exterior walls is 28 ft. 4 in. and 31 ft. 8 in.; interior framing of steel columns and beams reduces floor spans to about 14 ft. and 16 ft. Welded bar truss joists 10 in. deep, spaced an average of about 2 ft., c. to c., support 2½-in. concrete slabs which serve as fire stops and sound deadeners. Wall height of the buildings is 26 ft.

Flat roofs, used on most of the houses, are similar in construction to the floors, with $2\frac{1}{2}$ -in. concrete slabs supported on bar trusses. On top of the concrete slab is placed a five-ply 75-lb. built-up roofing. Gable roofs, designed to relieve the architectural monotony of the community, have timber frames sheathed with $\frac{7}{8}$ -in. lumber which is covered with 30-lb. felt and Ludovici tile.

Interior partitions are constructed of gypsum block (90 per cent of it 4 in. thick) laid up to form 4-in. walls between apartments and 8-in. firewalls between separate building units, served by individual entrances, under the same roof.



FACE BRICK in box loads of 800 to 1,000 units are hoisted and shifted about by two crawler cranes. Crane slings are hooked to thimbles of wire ropes running under box. Job makes use of eighteen 4x12-tt boxes, stittened by 4x4-in, edge angles, to handle brick, block, mortar materials, concrete lintels and stone sills.





MARCY VILLAGE, private housing project in Indianapolis, includes nineteen two-story apartment houses containing 277 living units of 1,093 rooms Houses are of fire-resistant wall-bearing construction, with interior steel frames and flat or gable roofs



EXTERIOR WALLS consist of 4-in. face brick bonded by metal ties to 8-in. backup block of lightweight concrete.



BAR TRUSS JOISTS supporting concrete floor slab are stiffened by concrete rib at center of span. Sleepers are set into floor slab on about 16-in. centers to take nails of red oak flooring.

Ceilings are lathed with gypsum board attached to the joists. In the second-story ceiling, 4 in. of rock wool insulation is placed on top of the gypsum board lath. The interior of the apartment houses was given a three-coat plaster job, the exterior walls first being waterproofed with a plaster bond having an asphalt base.

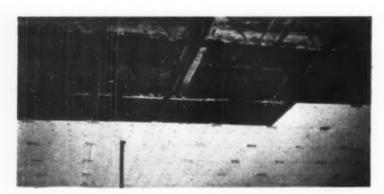
Materials Quantities—Of the principal materials required for the buildings, the project consumed about 7,000 cu.yd. of concrete, 200,000 concrete block (8x12x16 in.), 1,500,000 wire-cut face brick, 250,000 Haydite block, (8x8x16 in.), sufficient bar trusses for 260,000 sq.ft. of floor and roof slabs, 80 tons of structural steel, 630,000 sq.ft. of gypsum partition block, 2,645 steel door bucks and 1,834 steel casement win-

dows. The two cranes were in continuous service handling the bulk of the structural and masonry materials.

Ready-mixed concrete delivered by truck mixers was discharged into an Insley 1½-yd. hopper-type bucket which was swung into position for dumping by the larger crane, using a two-part load line on the gooseneck tip of its 50-ft. boom. A total of eight men (six laborers and two finishers) placed and finished all the concrete slabs, the laborers swinging the bucket on the load line when necessary to spread the concrete where desired.

Floor areas of the buildings ranged from 5,700 to 16,000 sq.ft. The crew was able to complete the floor slab on 5,700

(Continued on page 121)



GYPSUM BOARD LATH for ceilings is clipped to lower chords of bar trusses.



FORMS FOR CONCRETE SLAB are 1x8-in, boards supported in part by steel angles tied under top chords of bar trusses. Metal pan is in position to form monolithic reinforced-concrete stiffening rib at center of span.



INTERIOR PARTITIONS consist of 4-in. gypsum block laid up in single or double thickness, with exception of small percentage of partitions built with 3-in. block. Base course of partitions, laid on concrete floor slabs, is lightweight concrete block.



GEORGE WASHINGTON'S VISAGE emerges from side of Mt. Rushmore, Rapid City, S. D., as workmen drill and broach hard rock in accordance with directions of Sculptor Gutzon Borglum, who is carving mammoth likenesses of Washington, Jefferson, Lincoln and Theodore Roosevelt at this national memorial.

oddities

DIFFERENT WEIGHTS, SAME STRENGTHI Here is a graphic comparison of the sizes and breaking strengths of heavy manila rope, dredge chain, regular wire rope and braided wire rope used for slings. Varying in size and weight, all of these products have approximately the same breaking strength. At the left is a Macwhyte braided sling (of 5/16-in, wire ropes) weighing 128 lb per foot and possessing a breaking strength of 32.4 tons. Next comes a 7/8-in, diameter wire rope, less flexible than the braided type, with a weight of 1.23 lb, per foot and a breaking strength of 32.2 tons. The manila rope is 3 in, in diameter, weighs 3.72 lb, per foot and breaks at 30.5 tons. Finally comes the heavy dredge chain of 1-in, links, weighing 10.65 lb, per foot and breaking at 31 tons. In the braided sling, strongest of all four, eight individual wire ropes are combined, four being left lay and four right lay.





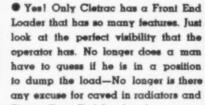
BEACHCOMBER THAT COMBS CLEAN is this 10-ft. rake devised by John McCready, street superintendent, Hermosa Beach, Calif., to remove kelp and debris from public beach into surf.

Hooked up to Allis-Chalmers tractor equipped with muffler to avoid disturbing citizens, unit starts work at 4 a.m. and by noon has cleaned up 2 mi. of beach 300 ft. wide.

ONLY CIPE



ANGLE ON YOUR DIRT MOVING . . . USE CLETRACS



grilles—With the Cletrac Front End Loader, the operator has full view of where he is going and what he is doing. Hydraulically operated by a single lever, the bucket can be dumped at any height, thus giving all the advantages of both the low lift and high lift in one unit. There are no vertical booms to interfere with operating through doorway or low openings. There is no extra weight on the front end of the tractor—it is carried by the side frames. This feature directly increased the lifting capacity.



BUCKET ...

Only Cletrae has a leader whose bucket cutting edge is wider than the inactor. There is no see-sawing for feeting with a Cletrae. The bucket is one-place reinforced hi-tensile strength alloy steel. The cutting edge is reversible and replaceable. Wear stripe are provided as the battom and are easily replaced.





A 9-tooth heavy duty somifier is available for breaking on freeze or extremely hard ground.

THE CLEVELAND TRACTOR COMPANY... CLEVELAND, OHIO...A COMPLETE LIN

PAS MAS 171

CONTROLLED TIP-UP BUCKET

Exclusive with Cletrac—The Bucket is pivoted at the lower rear section and as it is raised, it automatically tilts backward to an angle of 15 degrees, where it stays until tripped. This feature allows you to take heaping loads without spilling either off the front or rear edge of the bucket. With a loading height of 8½ feet you can easily load high trucks, gondola cars, and other similar vehicles. For loading mow and other light materials larger sized buckets are available. The loader may be removed in a matter of minutes, allowing you to use the tractor for any other power job on hand.

LET CLETRACS
PINCH THE PENNIES
FROM YOUR
YARDAGE COSTS

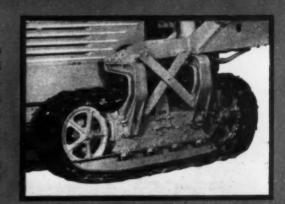
BULLDOZER FOR FILLING IN



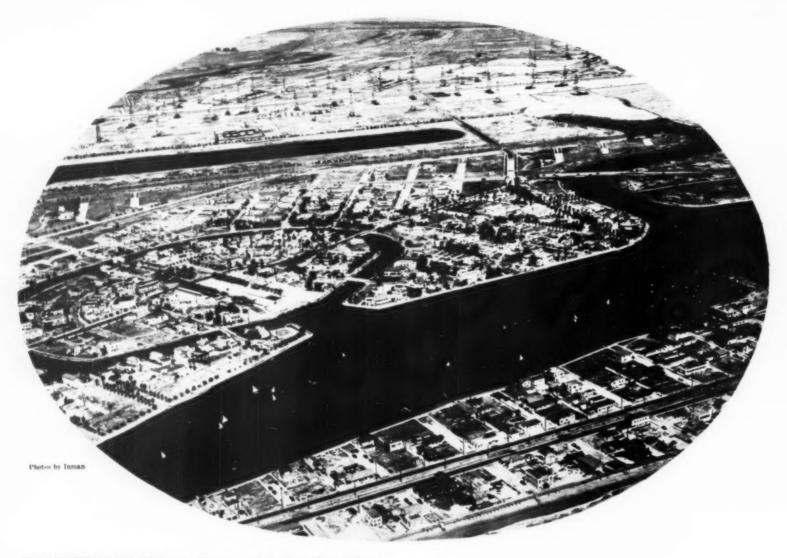
A 6% foot blade can be fitted an the push members is place of the bucket for leveling losse material.

EFFICIENCY...

The Cletrac Front End Loader adds no weight to the tractor frame, and equalizer springs. All weight is carried by the sturdy side frames and transmitted directly to the ground. There are no shocks or strains transmitted to the motor, motor frame, motor springs, or transmission case, as the load is not attached to any of these members in any trans-



ETI THE OF CRAWLER TRACTORS ... 14 TO 95 H.P., GASOLINE OR DIESEL



BUILT UP FROM LOWLANDS some 30 years ago, Naples section of Long Beach, Calif., replaces deteriorated seawalls bordering canals and boat basins with more than $2\,\mathrm{mi}$. of new concrete sheetpile construction.

CLAMSHELL DREDGING BY LAND CRANE (below) cleans debris and excess material out of canal adjacent to seawall.



Page 66 - CONSTRUCTION METHODS - March 1940

Concrete Sheetpile Walls RETAIN CANAL BANKS

PRECAST CONCRETE TONGUE-AND-GROOVE SHEETPILES installed by a skid driver with the aid of a water jet form 11,273 ft. of seawall recently completed by the Mojave Corp., contractor, to replace damaged existing walls lining canals and boat basins of the Naples residential area bordering Alamitos Bay in Long Beach, Calif. Original retaining walls of 2-in. timbers faced with concrete and anchored to deadmen had deteriorated from natural causes during almost 30 years since they were constructed, and the earthquake of March, 1933, had severely damaged some portions of old wall, requiring removal of about 3,400 lin.ft. as part of the recent contract. Where the existing walls were in good condition, the new wall was built 2 ft. in front of it, and the intervening space was left open to facilitate future inspection and repair of the new wal?



PRECAST CONCRETE SHEETPILES 10 in. thick and 22 to 26 ft. long are stored in stockpiles at casting yard.



DELIVERED BY TRUCK to loading point along canal bank, concrete sheetpiles are swung on to barge by crawler crane.

Concrete Sheetpiles—Reinforced-concrete piles measuring 10x24 in. in cross-section were cast in lengths of 22 to 26 ft. The concrete, produced by a Rex 10S mixer, contained 7 sacks of cement per cubic yard, and each pile was reinforced with about 350 lb. of 3/4-in. and 1/2-in. steel, which extended about 18 in. above the top of the pile to anchor the coping. At the point, each pile was sloped on a 45-deg. angle which served to force it against the adjacent pile while being driven. Pile forms were vibrated while concrete was being placed.

Skid Piledriver

From the casting yard, the sheetpiles were trucked 1½ mi. to a location on the canal bank where a crane loaded them on to a barge. Because of several bridges crossing the canals, it was necessary to use a skid rig instead of a floating driver to put down the piles. The skid driver drove temporary wood piles to support itself on the canal banks as it moved ahead. A floating centrifugal pump driven by a Cummins 150-hp. diesel engine supplied water to the pressure jet.

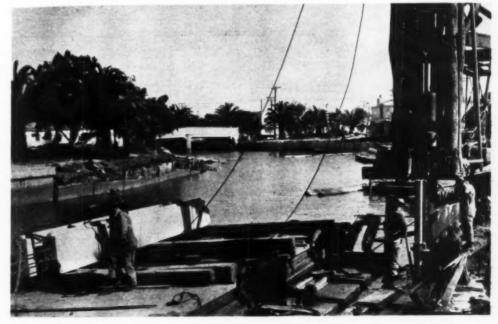
During driving, a wooden pile cap protected the top of the pile, and a sliding shoe along the forward edge of the pile, pulled tight by a cable to a steam winch, held the pile close to its previously driven neighbor.

Canals of the Naples area had been dredged to 12-ft. depth. To grout the joints between sheetpiles, the contractor used steel forms 12 ft. long clamped to opposite sides of the joint. Inside each steel form was a full-length rubber tube which was inflated after the forms had been clamped in position. The inflated rubber tubes closed the two sides of the joint and retained grout poured into the joint from the top.

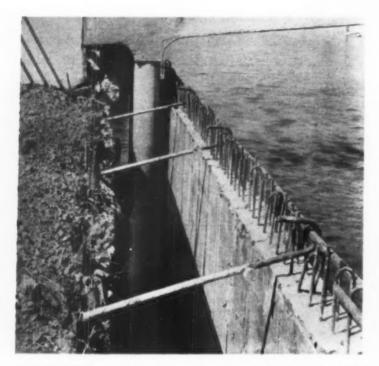
Wall Coping — Reinforcing steel at the top of the sheetpiles was tied by 13%-in. anchor rods to piles driven 20 ft. back from the wall. The wall coping was cast in place in steel forms which were filled with concrete delivered by



SKID DRIVER traveling on temporary pile-supported crubbing handles concrete sheetpiles off barge and drives them with aid of water jet supplied from floating pump at left.



SLIDING SHOE on forward edge of sheetpile is pulled tight by cable to steam winch, holding pile against its mate while driving is in progress.



ANCHOR RODS tie reinforcing steel of wall coping back to inshore piles and to abutments of existing bridges.



CLAMPED STEEL FORMS filled with inflated rubber tubes close two sides of joint to hold grout poured in from top.

hand carts. After 60 days allowed for settlement of material behind the walls, 6-ft. sidewalks were constructed where called for, concrete being poured in forms and anchored to the coping by steel dowels.

Drag Bucket — An ingenious openframe drag bucket designed by G. S. Markel, superintendent, assisted the contractor in fishing out concrete fragments of old walls which had fallen into the canals. For ordinary digging and



WELDED OPEN-FRAME DRAG BUCKET fishes concrete fragments of fallen walls out of canals.

removal of material, cranes were equipped with standard clamshell buckets. All excavated material was used as backfill behind the new walls.

Administration — Total cost of the improvement was about \$585,000. J. W. B. Blackman, city engineer and director of public service, was in charge of design and construction for Long Beach, Calif. Operations of the Mojave Corp., contractor, were directed by G. S. Markel, superintendent.



CONCRETE COPING is cast in steel forms on top of sheetpile wall by crew placing material from hand cart.



WHERE EXISTING WALL is in good condition, it is left standing, and old coping is cut to admit anchor bars of new wall constructed 2 ft. in front of it

EXPLOSIVES EXPERTS have blasted a ditch 35 ft. wide at the top, 6 ft. deep and 5,100 ft. long to carry condensing water to the Nanticoke River from the new nylon plant of E. I. du Pont de Nemours & Co., near Seaford, Del. Problems involved in the excavation were complicated by the proximity of the plant and dwellings in the town of Seaford at the start of the operation and by a heavy quagmire condition as the river was approached.

Because of the size of the ditch and the conditions encountered, the method chosen called first for blasting relief ditches on both sides of the main ditch line, placing four sticks (2 lb.) at 2-ft. intervals for this purpose. The center then was loaded in accordance with the cross-section method. Along the center line, seven sticks (3½ lb.) were placed 6 ft. deep on 2-ft. cen-



ters. Every 4 ft. along the center line, the crew put down four cross-section holes 6 ft. deep, 2 ft. and 4 ft. from the center on both sides, and loaded each of these holes with six sticks, or 3 lb. This method of loading obtained desired depth and clean excavation without dropping much yardage into the previously blasted ditch at the open end of the shot.

Near the plant and town, shots were limited to 200 lb. to reduce vibration. As the work progressed, it was possible to increase the loads to 500 lb., permitting relief ditches to be blasted in 500-ft. sections and center sections in lengths of about 100 ft.

As the ditch approached the river, the heavy quagmire condition made excavation particularly difficult. Initial blasting removed stumps and root mat, leaving most of the

(Continued on page 118)



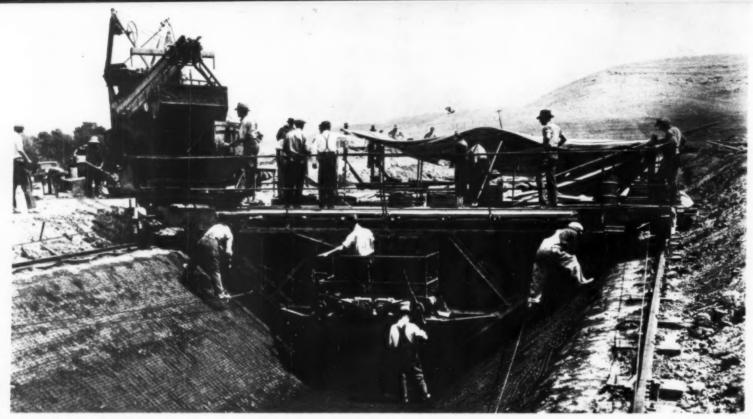
THROUGH MAT of roots and small stumps, crew sinks and loads cross-section holes for ditch blast.







AFTER SHOOTING, inspector checks ditch cross-section with sounding pole.



HOT ASPHALTIC CONCRETE hauled 50 mi. by truck from Oakland, Calif., and agitated by standard concrete mixer is placed in experimental section of Contra Costa canal by regular canal lining machine. This section, 7 ft, wide at bottom, is lined to height of 7½ ft. with 3 in. of asphaltic concrete.

Asphaltic Lining
APPLIED ON
TEST SECTION OF
Contra Costa
Canal



TO PREVENT WEED GROWTH beneath asphaltic concrete lining, workman first sterilizes side slopes and bottom of canal with creosote spray. Wire mesh is used to reinforce asphaltic concrete lining.

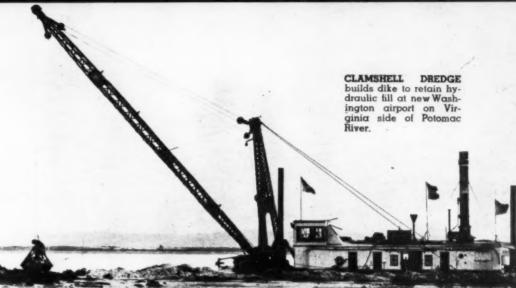
TO TEST THE MERITS AND COSTS of asphalt as a canal lining material in comparison with the usual portland cement concrete, the U.S. Bureau of Reclamation, in cooperation with the Asphalt Institute has applied this material to two short sections of the 46-mi.-long Contra Costa canal which is being built in California as part of the Central Valley project to deliver water from Shasta reservoir for use by industries and municipalities between its intake and a terminal reservoir on Vine Hill, near Martinez. The accompanying photographs illustrate the methods and equipment used in applying the asphalt lining to the canal section. The lining, 3 in. thick and reinforced with wire mesh is placed by a machine specially designed for that purpose.

LINED WITH ASPHALTIC CONCRETE (below) by same machine which placed portland cement concrete lining in foreground, experimental section will test serviceability and economy of black top paving for canals.



Pumped Fill

Creates New
Washington Airport
On Swampy Riverfront





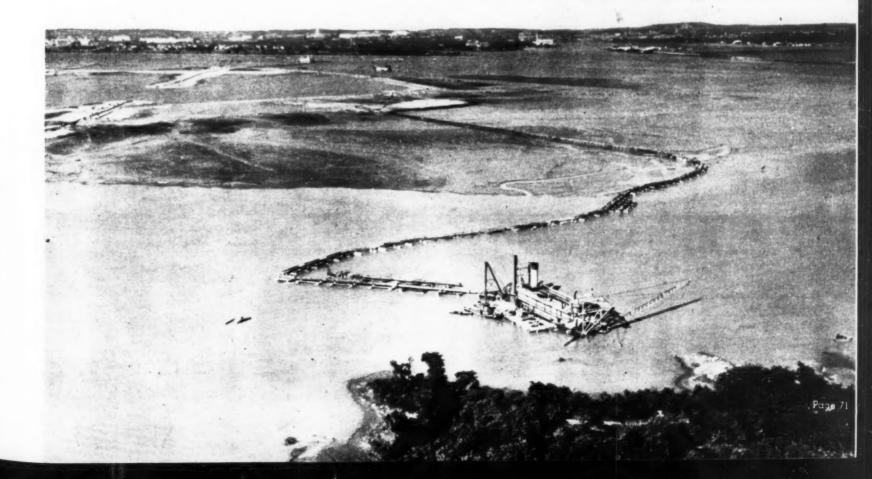
OPEN-END WRENCHES TIGHTEN BOLTS at ball joint coupling in pontoon line which carries pumped sand and gravel from dredge to fill.

SAND AND GRAVEL FILL pumped into long trenches from which most of the muck has been removed provides a firm foundation for four paved runways of the new \$10,000,000 Washington National Airport being built up from tidal swampland at Gravelly Point on the Virginia side of the Potomac River, 15 min. by motor car from the heart of the nation's capital. Four big hydraulic dredges working 24 hr. a day, six days a week are pumping 14,500,000 cu.yd. of fill material through pipe lines with an average length of 4,800 ft. and a maximum length of 6,000 ft. at an average rate of 485,000 cu.yd. per week. Hydraulic fill unsuited to runways is placed in intermediate areas.

Of a total of 742 acres to be occupied by the airport, 491 acres are in the landing field, including 325 acres formerly covered by water at high tide. Average depth of water over the submerged area was 3.3 ft., and the average elevation of land was 5.8 ft. above mean low water. Average ultimate runway level is set at El. 13.7, well above the record Potomac River flood of 11.3 ft. in March, 1936.

Runways-Landing facilities include a main north-south

FOUR HYDRAULIC DREDGES, three of which can be seen (below), pump sand and gravel from bed of Potomac River to fill swampland area for landing field of new airport. One runway in this view is being built up by end filling from two pipe lines. City of Washington lies opposite.



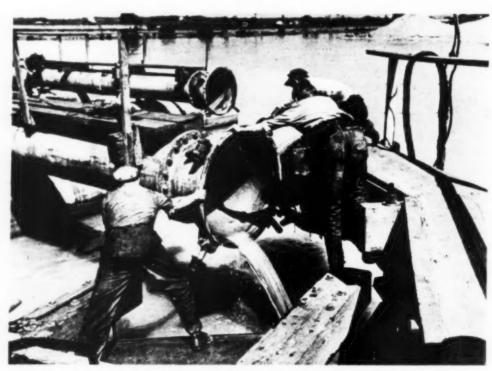


SUPPORTED ON STEEL-CYLINDER PONTOONS, long floating line connects dredge with land line depositing hydraulic fill material for airport

runway 6,875 ft. long and a northwestsoutheast runway 5,300 ft. long, both to have a 200-ft. paved surface on solid fill 220 ft. wide with 140-ft. gravel shoulders on each side, and two narrower runways in northeast-southwest and east-west directions, 4,820 and 4,200 ft. long, respectively, with 150-ft. paving on 170-ft. wide fills flanked by 165ft. shoulders. Numerous paved taxiways, totaling 11,000 lin. ft., will connect the various runways with the central terminal station. The terminal building will be out in the open, commanding a view of all runways, while hangars, administration and service buildings will be placed back from the landing field in a land area which requires relocation of about a mile of the Mt. Vernon highway. Grading of the land section provides about 750,000 cu. yd. of dry material for spreading over intermediate fill areas.

Four Dredges

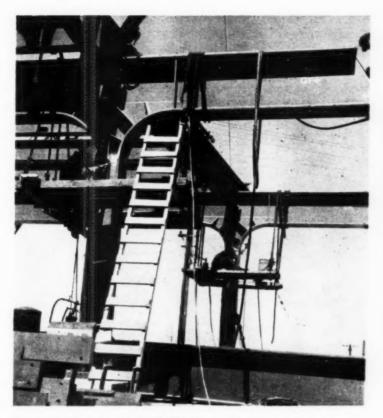
All hydraulic fill work is under the direction of the Washington District Office, U.S. Engineers. Because of the necessity of moving dredges frequently to obtain selected material, the army engineers hired dredges instead of letting the work by contract. Three rented dredges, the 28-in. Lake Ellendale of the Standard Dredging Co., the 28-in. Gulfstream of the McWilliams Dredging Co., and the 27-in. Pennsylvania of the American Dredging Co. have



WORKMEN SWING SECTIONS of pontoon pipe line to make connection at ball coupling.





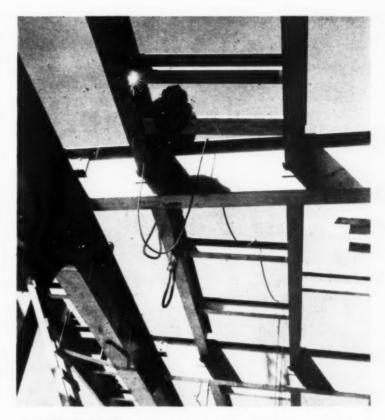


SHOP-FABRICATED GIRDER SECTIONS of welded frame units in approach structure are welded to columns. Cantilever girder extending about 12 ft from column is cut on 30-deg. bias, with lower splice plate welded on to support adjoining central portion of girder while welded connection is made at this point.



OF 70 MI. OF ARC WELDING involved in construction of the new Main Ave. bridge crossing the Cuyahoga River in Cleveland, Ohio, 40 mi. is in two 120-ft. welded frame units for the north and south ramps of the westerly approach. Steel grid flooring, laid in panels which were weided together before being filled with concrete, required 141/2 mi. of welding, while steel railings took 10 mi., steel curbs, 41/2 mi., and lighting standards, 1 mi. Gutter drains also were arc welded.

For the bridge and for the approaches, the general contractors were, respectively, the R. C. Mahon Co., Detroit, and the Sam W. Emerson Co., Cleveland. The Mount Vernon Bridge Co., Mount Vernon, Ohio, fabricated the steel, including the arc-welded members. Field welding was performed by the Bass Construction Co., Cleveland, which did the erection welding, and by the Great Lakes Welding & Boiler Co., Cleveland, subcontractor for floor welding. Lincoln electrodes and machines were used for most of the welding.

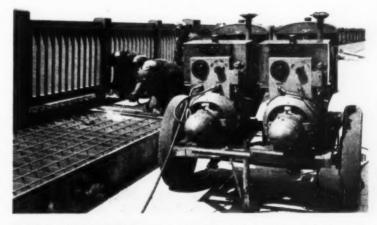


OVERHEAD WELDING is required to connect transverse beams to seat angles on stringers. Stringers themselves rest on shop-welded seats, and webs of stringers are welded to web of floor beam



MAKING CON-NECTION (left) between main section of girder and stub girder of T head on column operator welds flanges and webcut on 30-deg angle. Flange joints are beveled 45 deg. for single V groove downhand welds. Similar V groove welds have between main sec

groove welds have been built up in both sides of web joint, following stagger welding to control expansion and contraction



PREFABRICATED PANELS of steel grid flooring for roadway and sidewalks are welded in place. Concrete deck h reinforcement of roadway in foreground Concrete deck has been completed on steel grid

Step-by-Step Field Methods HOW TRUCK-CRANE INSTALLS PRECAST MANHOLES BY CAISSON METHOD

BY USING PRECAST, instead of pouredin-place, units placed by the caisson method with the aid of a specially equipped truck-crane, the Consolidated Edison Co. of New York has been able to cut from 5 days to 8 hr. the time of installing concrete manholes for electric utility service. How this result was accomplished was explained by Lewis F. Scofield, manager of the company's outside plant construction department in a paper presented last month before a meeting in St. Louis, Mo., of the Transmission and Distribution Committee of the Edison Electric Institute.

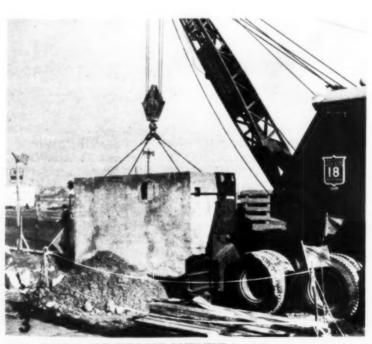
Superseding the former poured-in-



MOBILE TRUCK CRANE of 16½-tons capacity is mounted on long chassis providing space for air compressor, 3/8-yd. clamshell bucket and racks for drills and other pneumatic tools. Unit has cruising speed of 35 m.p.h.



PRECAST CONCRETE MANHOLE weighing 14 tons is delivered to installation site in trailer and picked up with aid of wire rope slings by boom of truck-crane.



INTO OPENING CUT THROUGH PAVEMENT by drill crew precast manhole is lowered into position for sinking as a caisson by excavation from inside with clamshell bucket.

place, manholes, the new precast concrete units, of which 165 have been placed by the caisson method, now adopted as standard, range in size from $7x3\frac{1}{2}x5$ ft. to 11x4 $1/6x6\frac{1}{2}$ ft.

The basic advantages of the caisson method over the poured-in-the-field method formerly used according to Mr. Scofield, are:

- (1) The placing of the steel reinforcement, assembling of the forms and pouring of the concrete are transferred from the field to the construction yard where they can be performed by closely controlled mechanized methods.
- (2) The use of temporary shoring in the field is eliminated, since the caisson manhole walls serve as an integral shoring assembly. This is conducive to safety.
- (3) The hindrance to street traffic is materially reduced since several field operations are eliminated and there is no waiting for the concrete to cure. A transformer manhole can be constructed by this method and the transformer installed in one 8-hr. day.

Caisson Method

The major steps in the installation of a caisson type manhole are shown in the accompanying illustrations. After the pavement has been broken and removed, the precast caisson is set in place by a truck-crane and all excavating is done from inside the caisson walls. The earth is removed by a clamshell bucket within the caisson and at intervals two men with pneumatic spades are sent into the manhole to remove the earth remaining under the walls, thus causing the caisson to sink. This process is repeated from three to six times until the walls have been lowered to the required depth. The sinking of the caisson takes from 1 to 11/2 hr. to complete.

The base for the floor then is leveled and tamped, and a precast floor slab is lowered into place and bolted to the walls, thus making an integral unit of the manhole. Wherever required, a precast sump pit is fitted into an opening in the floor after which grout is poured into the joints between the sump and the floor as well as the floor and the walls. The bolts and angle iron joining the walls and floor then are covered with mortar. If the manhole being built is a transformer manhole, the transformer unit is installed immediately, since the floor and walls are now rigidly joined and there is no need of waiting for the grout to harden. The manhole roof also is of precast concrete construction. The openings around the caisson walls are finally backfilled and tamped and the street pavement restored.

Shop Casting Methods

Manhole units are precast in the shop, an overhead traveling crane being used to handle the forms and deliver the concrete in a bottom-dump bucket. Steel re-



AFTER MANHOLE IS SEATED just below pavement surface wire rope slings are removed preparatory to rigging clamshell excavating bucket on crane boom.

inforcing is assembled by welding and the necessary duct entrance forms, precast knockouts and inserts properly placed within the forms prior to concreting. The poured concrete is vibrated and allowed to cure for one day before forms are removed.

The number of forms required when the manholes are of the precast type is materially reduced as compared to the poured-in-the-field method. Formerly, several duplicate forms were required for those occasions when two or more similar holes were built simultaneously, but when the caisson method is used the manholes are built and stored in advance of requirements.

With the exception of restoring the pavement, the entire field operation, in-

cluding the placing of the transformer. is easily completed in one 8-hr. day, whereas to build a transformer manhole by the superseded method, Mr. Scofield points out, normally required 5 days (if temperatures were not too low to pour concrete in the field) because of the additional operations involved and the time lost while the concrete cured. For example, after the floor was poured approximately 2 hr. had to be allowed for the concrete to set before the wall forms could be installed, and after the walls were poured 2 days had to be allowed before the forms could be struck and the transformers placed.

The mobile crane used in this work, a Bay City machine on a Mack cab-over-

(Continued on page 91)



EXCAVATION WITHIN CAISSON MANHOLE is done by truck-crane equipped with \(\frac{1}{2}\)-yd. clamshell bucket. As material is removed, caisson sinks gradually to established grade. Earth under sidewalls is loosened occasionally by pneumatic spades.

Present and Accounted For

A PAGE OF PERSONALITIES



WATER SUPPLY PROJECT to bring Lake Michigan water 30 mi. to Grand Rapids, Mich., enlists abilities of (left to right): MILO OHR, engineering assistant to Peter Kammeraad, director of public service, Grand Rapids; WILLIAM QUINSEY, assistant engineer in charge for city of 16,000,000-gal. reservoir job; and EMIL J. RUTZ, superintendent for Pearson & Co., Benton Harbor, Mich., contractors for reservoir.



ON SANTEE-COOPER POWER PROJECT in South Carolina, involving construction of large earth dams and appurtenant structures to cost \$40,000,000, F. B. DANIEL, (left) superintendent for Sammons-Robertson Co., of Huntington, W. Va., subcontractor for Central Engineering Co. on Pinopolis dam, places \$95,900 order for Caterpillar tractors and allied equipment with BILL YOEMANS, salesman for Jeff Hunt Road Machinery Co. Transaction is witnessed by LUCIAN SAMMONS, son of contractor, and DON WILLIAMS, purchasing agent.



ON FEDERAL OFFICE BUILDING in Washington, D. C., six-story reinforced concrete frame structure 320x360 ft. in plan, being built under \$2,487,800 contract by McCloskey & Co., of Philadelphia, HUGH GIBSON (left) construction superintendent in charge of job, confers with M. H. McCLOSKEY, Jr.



CONTRACTOR ON AM. SOC. C.E. BOARD. Traditionally composed in large part of engineers, the Board of Direction of American Society of Civil Engineers this year has a contractor in its membership. He is LAZARUS WHITE, president of Spencer, White & Prentis, Inc., of New York City, specialists in foundation and underpinning work. Mr. White was formerly division engineer on New York City's Catskill aqueduct.



WHEN POTRERO SHAFT, 800 ft. deep, for San Jacinto tunnel of Colorado River aqueduct was suddenly flooded as result of break in 12-in. discharge pipe of special pump, WALTER BAER, superintendent for Wenzel & Henoch Construction Co., is man who saved pump for later raising by making ¾-in. cable fast to broken pipe as he climbed ladder in darkness to escape rapidly rising water.



AMERICAN BOAD BUILDERS' ASSOCIATION opens thirty-seventh annual convention and Road Show in International Ampitheatre, Chicago, Jan. 29. Participating in ceremonies are (left to right): CHARLES M. UPHAM, engineer-director of A.R.B.A.; G. D. KENNEDY, deputy highway commissioner, Michigan; HAL G. SOURS, assistant director and chief engineer, Ohio State Highway Department, and president-elect of A. R. B. A.; MURRAY D. VAN WAG-ONER, president, A. R. B. A., and highway commissioner of Michigan; Congressmen J. W. ROBINSON, Utah, WILBURN CARTWRIGHT, Oklahoma, and JENNINGS RANDOLPH, all members of the House Committee on Roads.

CONSTRUCTION EQUIPMENT NEWS

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Review of Construction Machinery and Materials for

MARCH 1940



ADJUSTABLE SAFETY PROP which can be set up and wedged tight by one man is applicable to use in tunnels, mines, shoring and talsework. To set prop, workman raises extensible timber leg against roof and drives lower wedge which locks dog into timber, preventing prop from dropping until wedge is driven back. Pivoted cap plate then is tightened against roof by driving upper wedge. For ceilings which are too high to permit driving cap wedge from floor, props can be obtained with plate and wedge at bottom. Cap is designed with four holes to permit attachment of wooden boards for greater bearing area. Hand lever is available for raising loads on timber leg, and ropes can be used with knockout block to drive wedge back, dropping prop and pulling it clear while man stands at safe distance.—Markham Products Co., Empire Building, Birmingham, Ala.

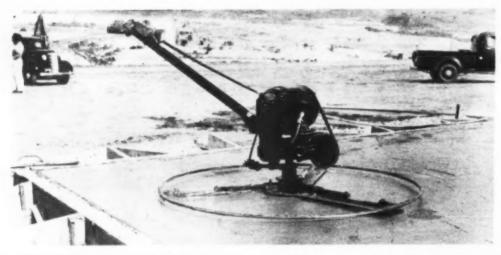


ALL-WHEEL DRIVE AND STEER MECHANISM has been installed on improved "99" power grader to increase versatility, making machine capable of handling rough grading, terracing and drainage, heavy ditching, soil mixing, maintenance, snow removal, scarifying and contractors' work. All-wheel drive provides pulling as well as pushing force to blade which is placed between traction wheels instead of in front of them, thus making blade more stable. When scarifying or snow plowing, front drive wheels control front end load. All-wheel drive employs same size front and back wheels which roll over rough ground or obstructions easily, their driving power increasing this rolling and climbing ability All-wheel steer enables grader to

offset its frame—to run it parallel to side-thrust (side-draft) against blade, to balance entire machine and traction wheels against load, to distribute working power along full length of blade to make steering more responsive; to neutralize side draft; to hold direction of travel. Also enables it to make short turns; to grade or ditch around sharp curves; to get in and out of cramped spaces. Other features: Hydraulic power adjustments; precision side shift; stabilized blade; balanced design. Working attachments loader, finisher (shown in photo) disk harrow roller, broom, bulldozer, snow plow and wing and scarifier. Gasoline or diesel engine operated—Austin-Western Road Machinery Co., Aurora, Ill.



per-minute capacity for quarry, gravel bank and general service has following teatures: (1) Large engine—60-hp., 6-cylinder Waukesha, self-starting, with oil bath intake air cleaner, oil filter gasoline strainer and inbuilt throttling governor. (2) wholly inclosed transmission, gears and clutches running in oil and at slow speed; (3) revolving propeller feeding device on high carbon nickel alloy tail shaft assures positive feed ing; (4) slow speed crowding with 5-ft-per-minute drive; (5) toothed buckets to make digging easy—size 22x12x10 in.; ¾-cu.ft. capacity by water level measure. Two models—standard machine for stockpile loading and general service; "gravel bank special" with protection plates to prevent burial of machine by avalanching bank—George Haiss Mfg. Co., Inc., Canal Place and Rider Ave., New York City.

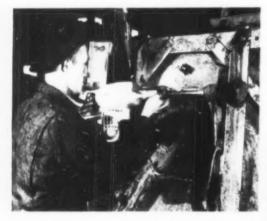


POWER-DRIVEN CEMENT FLOOR FINISHER (right), either electrical or gasoline motored, eliminates laborious and fatiguing methods of hand troweling and is said to give uniform distribution of coarse aggregate particles through entire depth of finish preventing accumulation of latance film and weak mortar and assuring flatter, smoother floors. Rotates three-bladed feathering propeller with controlled pitch trowels and covers 40-in. span. Equipped with Westinghouse 34-hp. repulsion induction motor interchangeable with

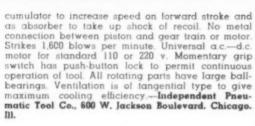
either 110 or 220 v. Said to be simple to operate, slight turn of wheel on operator's end of handle giving instant tilt to rotating trowels, setting them to micrometrical adjustment of pitch while machine is in motion. Slight downward pressure on handle causes finisher to move to right; upward pull causes it to move to left. Circular guard prevents accidents. Other features: Complete operating control; finger snap switch; V-belt drive. Especially useful for finishing color work.—Whiteman Mig. Co., 3060 Glendale Blvd., Los Angeles.

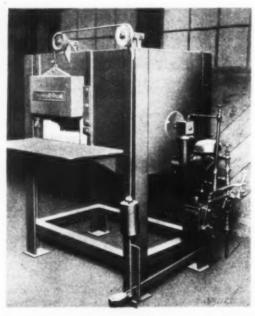
NEW PORTABLE ELECTRIC HAMMER, striking powerful blow, weighs only 14 lb., is 13½ in. long and has capacity in concrete up to 1 in. star drill. Outstanding mechanical feature of Thor-Nado unit is sling-shot" drive, in which hammer action of piston is produced by shock-proof rubber connection. This type of drive, operated by large reducing gear, whips piston back and forth, acting as power ac-

tors of similar horsepower, scraper is said to dig under positive pressure in all kinds of soil—to load, haul and back-dump. Cutting blade may be raised or lowered, load may be closed and dumping accomplished while machine is in motion. Twin, twoway action hydraulic jacks actuate digging bucket and are said to provide accurate control by tractor operator of all digging, loading and carrying operations.—Gar Wood Industries, Inc., Detroit, Mich.



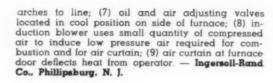
RAPID HEATING FURNACE for servicing of I-R Jackbits, hotmills, grinders and for rehardening bits, is said to have high capacity because of its excellent insulation which consists of thick layer of insulation brick outside of layer of firebrick, allowing minimum escape of heat, reducing cost of fuel and insuring lower room temperature for operator, Jackfurnace when heating bits for reharden-





HYDRAULICALLY OPERATED SCRAPER, 3-yd. 2-wheel, is available for use by county and township officials and small contractors who are looking for low-priced, earth-moving utility machine. Used with Allis-Chalmers M and WM models and other trac-

ing turns out approximately 180 per hour. Features: (1) Properly proportioned combustion and heating chamber promotes "better heating" atmosphere, reducing scaling and decarbonization; (2) low pressure air from induction blower passes through preheating chamber before entering burner, thereby aiding combustion and increasing efficiency; (3) large shelf at furnace front facilitates handling of bits; (4) low pressure burner assures quiet operation; (5) fuelbox lined with refractory material which withstands high temperatures; (6) all bricks of economical size and type for easy replacement — no



TUNNEL MUCK LOADERS in two new models, with rocker-arm mucking action and level bucket capacities of $5\frac{1}{2}$ and 9 cu.ft. respectively, are designed to meet demand for higher loading speed. Highspeed, bucket-elevating motors on Eimco-Finlay units are operated by air at pressures from 40 to 100 lb. per square inch. Loading capacities per minute are 20-35 cu.ft. for Model 12-13 and 30-50 cu.ft. for Model 21. New control equipment with larger air passages and practical elimination of



piping from side sheet are recent improvements. Important connections are located where they cannot be injured by falling muck. Air filter keeps dirt and water out of cylinders. Other features are positive automatic centering device, digging width and crowding-thrust stops. New bucket-elevating motors and control mechanisms can be applied to earlier models of machine. Loaders have weights of 4,000 and 5,700 lb., respectively, and digging widths of 76 and 85 in., which can be extended 2 or 3 ft. for cleanup by side plow attachment. Buckets are available with renewable toothed manganese-steel digging lip or with stellited roundnose digging lip—Eimco Corp., 634 South Fourth West St., Salt Lake City, Utah.

TRACTOR SWEEPER, cleaning 60-in. path, for use with Allis-Chalmers tractors featuring shorter sweeping path and lighter weight is said to be particularly useful for skating pond and sidewalk clearing and for cleaning walks, ramps and platforms in parks, industrial plants and material yards. Operating advantages said to include efficient sweeping, quick, easy lift of broom readily adjusted ground



pressure, minimum broom wear and simple attachment and detachment from tractor. Furnished with dust hood which is readily removed for snow work. Broom, operating in self-aligning bearings, is chain driven through ratchet-type clutch. Gear boxes ruggedly made and fitted with hardened cut steel gears and ball-and-roller bearings. Heavy-duty roller chains and hardened sprocket wheels for final drive protected by safety guard. Weight, 1,000 lb.—Frank G. Heugh Co., Libertyville, Ill.



Page 78 - CONSTRUCTION METHODS - March 1940



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> Because American Chain engineers perfected the art of welding chain links on the ends instead of the sidesand because they developed a new alloy -users are getting "4 to 1 longer chain life in tough service." Endweldur Chains stand up under elevated and subzero temperatures, moderate impact loadings and bending and gouging.

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In the American Chain line, largest and most complete in the world there are welded and weldless chains of all types, sizes and materials -and every conceivable kind of chain fittings

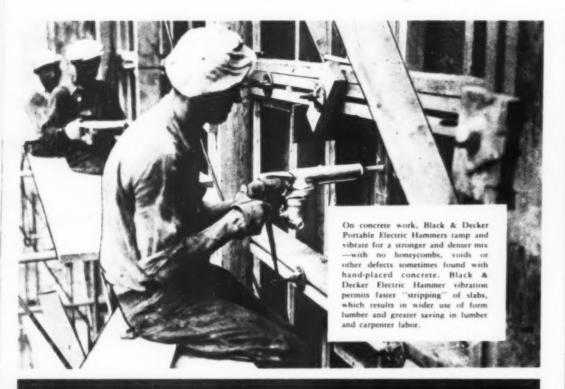
and attachments. All these chains, fittings and attachments are designed for your safety, economy and convenience and are thoroughly pretested in our laboratories.

SUMMARIZED: American Chain offers a full line of welded and weldless chain—also cotter pins, eye bolts, cold shuts, lap links, round eyes, malleable castings, grab hooks, slip hooks, sash chain fixtures, screw hook hangers, shackles, Shooks, sling chain hooks, snaps, special attachments, swivels, toggles, utility jacks, welded rings, etc.

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Speed Up Work, Cut Costs on drilling . Channeling . Tamping vibrating . Gouging and Chipping Jobs

Black & Decker's New Portable Electric Hammers help you finish work ahead of schedule. They speed up such jobs as drilling and channeling in concrete, stone or brick, vibrating and tamping concrete, removing form marks, caulking pipe line joints, gouging and shaping wood beams, demolition work, chipping metal—and many other construction operations frequently performed by slow, costly hand-labor. They require no special equipment—are simply plugged in any electric socket. There are four models in the Black & Decker Portable Electric Hammer

line with capacities ranging from light scaling to "brute" demolition work. In addition, 15 accessory Hammer tools—including star drills, diamond points, cold chisels, bull points, bushing tools, wood gouges make B & D Electric Hammers the all-around tool for every type of heavy construction job. Ask your Jobber for a demonstration—or write for FREE Illustrated "Hammer Handbook," showing construction, operation and uses of portable electric Hammers. The Black & Decker Mfg. Co., 758 Penna. Ave., Towson, Md.



On every type of scaling job — removing rust, old paint, weld spatter, the work is quickly and easily performed by Black & Decker Electric Hammers equipped with scaling chisels.

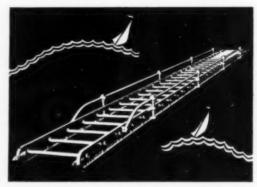
Black & Decker Electric Hammers fitted with star drills drive clean, round holes, and save hours of time ordinarily needed to break through paving to install manholes for gas, water, powers or phone



On demolition jobs, Black & Decker Electric Hammers fitted with bull points break out large sections of bricks, concrete, stone, in a fraction of the time required by hand.

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ALUMINUM LADDER, especially suited for use in storage of materials and maintenance work in industrial plants, is equipped with handrails on both sides and steel and aluinum spikes on bottom. Aluminum spikes do not throw spark and therefore



are recommended for use around oil tanks and other places where inflammable materials are being handled. New ladder supplied in lengths up to 36 ft. and in various widths. Corrugated rungs to prevent slipping. Cannot rust, rot, splinter or burn and is said to be twice as strong as ordinary ladder. Light weight makes it easily portable.—Aluminum Ladder Co., 373 Adams St., Tarentum, Pa.

TRAILER ROAD SWEEPER, axle driven from both rear wheels, sweeps either to right or left, necessary change being made by one man in few seconds. Overall width of brush, 8 ft., with actual fibre width of 7 ft. 2 in. and diameter of 33 in. Hickory, bamboo



or wire brushes available. With brush at right angles, overall width of machine is under 8 ft. which eliminates necessity of taking out overwidth permit or dismantling machine when moving from job to job. Three sweeping speeds provided by transmission, with gears running in oil. Anti-friction type bearings with dust seals. Rear-wheel drive provides ample traction, even though machine is comparatively light weight. Tires, 6.00x16 in.—W. E. Grace Mig. Co., Dallas, Tex.

SAFETY GOGGLE with non-rubber headband has eyecups molded from special material that combines light weight for comfort with high tensile strength for long wear. Claimed to be unaffected by exposure to water, oil, grease and perspiration. May be sterilized by any method without harm. Eyecups have broad bearing surfaces and are low set to provide wide angle vision. Non-rubber headband consists of spring-and-ball chain, covered by cloth sleeving, which prevents over extension of spring,



yet permits instant aajusiment to any aestrea nead size. When adjusted it is said to maintain same tension indefinitely but may be readjusted for different head sizes. Lenses are 6.00 curve clear Super Armorplate type. Caps holding lenses in place are precision threaded to insure easy removal for replacement of lenses. Metal screens provide adequate ventilation. — American Optical Co., Southbridge, Mass.



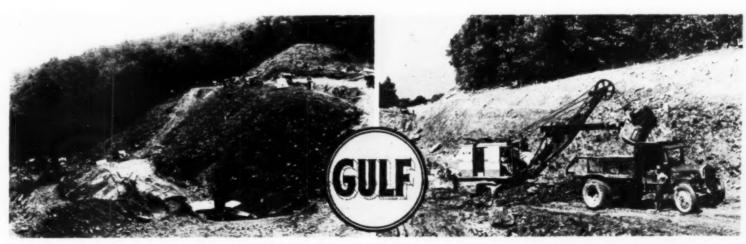
"WE HAVE enjoyed complete freedom from the common run of mechanical troubles on this job with Gulf lubricants and fuels in service," says the Superintendent on this important Turnpike job. "The Gulf engineer has given us recommendations which have been of real assistance."

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your job, you are assured of a reliable source of supply for quality lubricants and fuels when you get in touch with the Gulf representative in your vicinity.

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Use Laughlin Safety Clips and avoid rope-crimping with U-Bolt Clips.



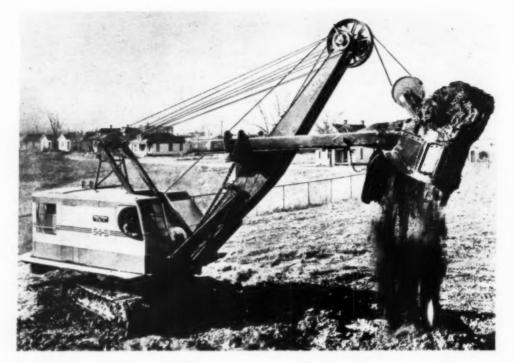
FEWER CLIPS NEEDED. Laughlin Safety Clips are so efficient that three of them give you the same strength as four ordinary U-Bolt Clips.

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5	Ciril I	(CASS)



DIESEL-POWERED CONVERTIBLE SHOVEL, 2½-cu.yd. capacity, said to offer rugged strength of larger heavy-duty quarry and mining machine combined with speed and mobility of smaller unit. Shovel has quarry-type boom, wide outside dipper sticks, welded, heavy-duty dipper and positive, independent crowd, yet is said to be so compact that it can be shipped without major dismantling. Clutches have few parts, interchangeable bands and are easy of access, meaning few adjustments and easy maintenance. Accessibility was another concern of makers. Right side of cab is free of machinery and roomy cross-aisle between engine and main machinery provides ample space for adjustments. Drive shaft is in two sections, either one removable without disturbing other. Ratchet-type choking brakes provide quick, free move-up for either dragline or shovel, with automatic locking against pushback of digging action. Extra large tapered "swamp cats" available for dragline work on soft ground. Independent power boom hoist for crane or clamshell service. Electric drive may be substituted for diesel power. — Bucyrus-Erie Co., South Milwaukee, Wis.

THREE NEW TAPES for splicing insulation of different types of cable are as follows: (1) G-E 330 for use with super-aging insulations such as Aquanol, Tempernol and Versatol, said to have low water absorption, excellent tensile strength and elasticity, to handle well in splicing, to fuse quickly and to possess high dielectric strength. May be used for making both vulcanized and unvulcanized splices; (2) G-E 351 oil-base rubber tape for use in splicing insulation of high-valtage cables, said to make water-

tight joint, to possess good electrical insulating characteristics and to have high dielectric strength. May also be used in vulcanized and unvulcanized splices, (3) G-E 387, Tellerium compound splicing tape for use in patching and splicing tough rubber jackets of cables must be vulcanized for making satisfactory cable joints. Splices made with it are claimed to possess excellent aging and protective properties typical of all tellerium jackets.—General Electric Co.. Bridgeport, Conn.

SOUND DEADENING MATERIAL called "Absorbex" for use on walls and ceilings of rooms used for bowling alleys is said to reduce noise and to enable players to make better scores. Made of matted mass of cement-coated, long, coarse wood shreds in tile-like form containing hundreds of small connect-



ing passages which trap and dissipate noise reverberations quieting clamor caused by rumble of balls and crash of pins. Rough surface of Absorbex said to provide unusual decorative surface. Natural gray finish may be used in color scheme, or if other decorations are desired, murals may be painted on sheets or they may be spray painted without impairing sound-absorbing efficiency.—The Celotex Corp., 919 N. Michigan Ave., Chicago, Ill.



ERE is the New Barber-Greene Model 522, Pneumatic Tired Bucket Loader. It combines all of the many Barber-Greene Bucket Loader Features into a small, compact, low-cost unit that can be quickly hitched to a truck and towed at truck speed.

This new Barber-Greene makes other loading methods too expensive. It has innumerable uses for contractors, maintenance departments, material yards, etc.

The Low Clearance, Swivel Conveyor Discharge Model is ideal wherever low height is needed, or in jobs like the shoulder clean-up operation shown above where the trucks drive straight under and out - no backing up - no delay.

The conventional design shown at the right is the most economical answer for all straight loading jobs. The 522 can be an important factor in reducing your loading costs, and in allowing a more economical material handling system.





EENE

March 1940 - CONSTRUCTION METHODS - Page 83

MONOTUBES HIGH-LOAD PILES!

Monotubes of varying gauges of steel and of unlimited combination of assembly are available to drive and develop economically the maximum safe load values of deep soil strata.

To date, these sturdy steel casings have been driven in lengths of over 130 ft. and tested to 200 ton loads. WRITE FOR COPY OF CATALOG No. 68A

PER PILE

85 TONS

Rock Island R. R. Bridge Trestle Bents, Metz, Iowa

62 TONS

PER PILE

Grade Separation, Winnetka, III.

50 tons

PER PILE

Water Tank Foundation, Town of Lake, Wis.

50 tons PER PILE

Viaduct Foundation, Chicago, III.

50 tons

PER PILE

Oil Storage Tank Foundation, Bayonne, N. J.

40 TONS PER PILE

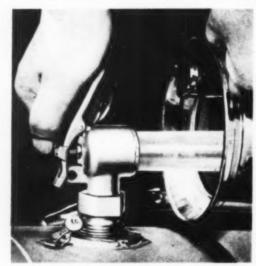
Municipal Light Plant Foundation, Cleveland, Ohio

• For maximum economy in your foundation design you can now allow higher loads on piling, if you specify Monotubes. This recommendation is based on fact—not theory. And to prove our point, we list below a few recent Monotube Pile installations for high design loads—



THE UNION METAL MANUFACTURING CO. CANTON, OHIO

OIL FAUCET for dispensing lubricating oil, paints, varnishes, glue, vegetable oils, and other viscous fluids from barrels and drums is said to provide fast flow and quick shutoff. Example of fast flow: Standard ¾-in. size flows 2 qt. of SAE oil at 78 deg. F. in 9 3/5 sec. under 2-ft. head. Operated by pushing



down on handle Self-closing. Moment operator releases handle stainless steel spring causes faucet to "click closed" and shut-off valve at end of nozzle prevents liquid from dripping. Outstanding feature: Neophrene seat vulcanized right into valve head. Dispenser can be locked open or closed and has special lug for sealing to sealed drums. Made in two sizes: ¾-in. I.P.T. for standard steel drums and l-in. I.P.T. for oil companies' sealed drums. Available in bronze or nickel finish.—The Imperial Brass Mig. Co., 1200 W. Harrison St., Chicago, Ill.

PIPE ARCH FOR LOW HEADROOM is of corrugated metal with flattened cross-section for shallow drainage openings. Manufactured in sizes with spans from 18 to 72 in and rises from 11 to 44 in., resulting in effective waterway areas of from 1.1 to 16.9



sq. ft. Available in plain galvanized or with bituminous-paved invert. Top and bottom plates are factory-riveted into single piece. Principal uses are for culverts under highways, railways, street intersections, for storm or sanitary sewers, and as conduits for gas, water, steam, electric and other utility lines. — Armco Drainage Products Association, Middleton. Ohio

RADIAL SAW, described as one-machine wood working shop, features type of construction which permits saw to pivot both horizontally and vertically around one point in center of table—that is, on every cross cut—straight, bevel, miter or compound mitre—regardless of angle, saw always enters cut at same point on table. Single saw point which gives Uni-Point its name, is said to eliminate guesswork and to make possible faster and more accurate work; no need to raise or lower saw for any cross-cutting operations. Accurate fixed gage

-Mall-

VIBRATORS PAY BIG DIVIDENDS



MALL 7000 r.p.m. gasoline powered vibrator on pneumatic mounting. Can also be used for CONCRETE SURFAC-ING, PUMPING, SAWING, DRILLING, SANDING and GRINDING.

MALL vibrators will quickly pay for themselves and pay you in savings on time, labor, cement and power. In addition, you get better bond with reinforcement—stronger, denser and more durable concrete free from aggregate pockets and honeycombs, thus eliminating hand patching.

Let us tell you more about our line of gasoline powered and electric vibrators for every type of concrete construction.

MALL TOOL COMPANY

Super-Vulcan OPEN TYPE

PILE HAMMERS

18c, 30c and 50c

There is the right size to suit every pile driving condition.

Fits same leaders—uses same accessories as Vulcan Single-Acting Pile Hammers and has the same characteristics.

Twice the number of blows per minute. Uses 25% to 35% less steam per blow.

VULCAN IRON WORKS

331 NORTH BELL AVENUE





ILLINOIS



and cut-off stops may be used and desired length of board obtained without hand measuring and regardless of angle of cut. Other features: (1) Telescoping overarm leaves no projecting parts or over-hanging mechanism, when saw is pushed back, to obstruct operator and frees table for laying out work; (2) safety feature: all control handles located at front of machine, obviating need for reaching over or around saw. Machine equipped with univer-



1

g.

sal knee so that motor can be turned in any posisal knee so that motor can be turned in any posiion for right- or left-hand ripping, bevel ripping
at any desired angle, dadoing, rabbetting, routing,
tenoning, sanding, shaping and other such operations. May be equipped with round safety jointer
heads, pneumatic sander drums, sander disks, all
types of dado heads and shaping and tenoning
cutters. Made in two sizes: "Junior" with 2-hp. motor
and saws up to 14 in., cutting off lumber up to
to 3x15 in. and ripping 28-in. wide or through center
of 56-in. panel: "Senior" with motors up to 7½ hp. to 3x15 in. and ripping 28-in. wide or through center of 56-in. panel; "Senior" with motors up to 7½ hp. and 18-in. saws, cutting 5x20-in. lumber and ripping 40-in. wide or through center of 80-in. piece, either right or left hand. Roller tables supplied for either machine and carrying base with handles for Junior machine, if desired. — American Sawmill Machinery Co., Hackettstown, N. J.

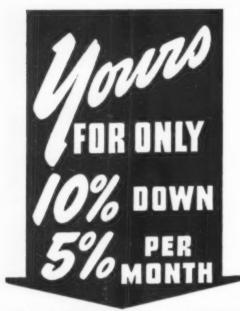
DRILL CLEANER, for reconditioning drill steel that has become plugged in use, will handle steel from starting length up to 8 ft. and of $1\frac{1}{4}$ -in. diameter, or smaller. After steel has



been inserted in mabeen inserted in ma-chine and crowding cyl-inder locked in operat-ting position, lever con-trolling program valve is moved forward clampis moved forward claimp-ing drill on to dolly by admitting air above crowding piston. Moving lever as far as it will go admits air to hammer which gives series of quick, sharp blows on lower end of dolly. These are transmitted to steel above, breaking up plug which falls out of vent hole in dolly. When air blowing from vent hole indicates that operation is complete, air control lever is returned to orig-inal position and steel removed from machine. particularly

with water before putting steel into cleaner. Air pressure needed for cleaning operation, 60 lb., or more. May be adapted to steel longer than 8 ft. by using longer crowding cylinders. For steel of more than 11/4-in. diameter special dollies can be furnished, and crowding piston may be reversed. For detachable bits special dollies can be made to fit bit ends of drill shanks. Net weight, 415 lb.—Pan-American Engineering Co., 820 Parker St., Berkeley.







Rex PUMPCRETE

Now! Rex makes it easier than ever before for you to enjoy the cost-cutting use of Rex Pumpcrete, the pump that pumps concrete. Buy it for all your jobs over 1000 yards, and even for some jobs of less than 1000 yards, and pay for it while you use it!

Now you can use Rex Pumpcretes and eliminate the need for costly buggy runs and many of the chutes, hoists, cars and wheelbarrows that eat up the profits on the ordinary concrete job! And, remember, whatever the size of your job, there is a Rex Pumpcrete to meet your need. They are built in capacities from 15 to 65 cubic yards per hour with a variety of pipe-line equipment for use on all ordinary, or unusual types of concreting work!



SEND FOR NEW CATALOG!

"How Costs Were Cut in Placing Over 10 Million Yards of Concrete" is a new catalog, prepared to show you fully the advantages you will gain when you turn to the Rex Pumperete for placing concrete. It's free—just drop a card in the mail, and your copy will come to you immediately!

Do It Now!



CHAIN BELT COMPANY Dept. PC-3 1664 W. Bruce St., Milwaukee, Wis.

BE THE WINNING BIDDER WITH

PUMPCRETE

THE PUMP THAT PUMPS CONCRETE

HIGH SPEED DIESEL CRAWLER TRACTORS, powered by General Motors diesel engines develops 130 hp. on belt, 106 hp. on drawbar and weighs 27,000 lb. Transmission with six forward speeds and two reverse provides forward speeds from 1.72 to 7 m.p.h. and reverse speeds from 2 to 3.20 m.p.h. Another



feature: Use of "Positive Seal" truck wheels, said to eliminate regular 10-hr. greasing, requiring lubrication only once every 200 hr. New steering clutches and brakes of bi-metallic material are claimed to decrease maintenance expense. Standard equipment: Heavy radiator guard, heavy full-width crankcase guard, heavy truck wheel guards, front pull hook, muffler, radiator shutters and electric starter. Handles larger scrapers 12-14-ft. blade graders, bulldozers, trailbuilders, rippers, winches, logging arches, wagons, snow plows and other auxiliary equipment.—Allis-Chalmers Mig. Co., Milwaukee, Wis.

NEW HEAVY-DUTY TRANSMISSION for Four-Wheel Drive Truck service has torque capacity in excess of largest truck engines available and is arranged so that regular five speeds provided in gear box may be supplemented with two-speed auxiliary providing for ten speeds forward and two speeds in reverse. All gears are helical constant mesh type except first and reverse. Sliding clutches said to insure easy shifting. Transfer case bolted directly to transmission in which 12-in.-wide silent chain transfers power from level of transmission.

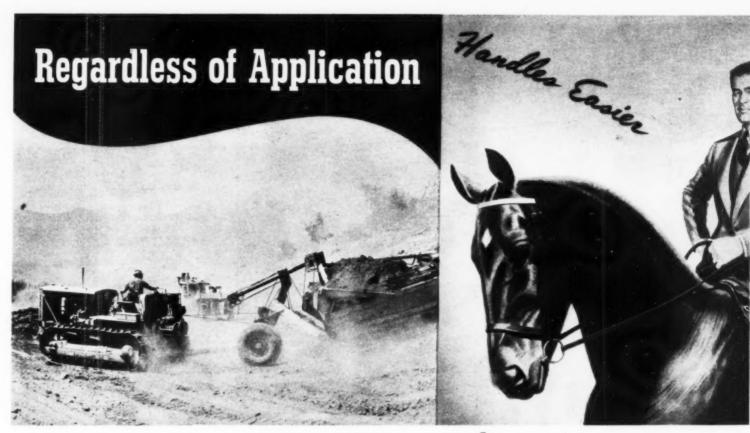


mission main shaft to point 17.7/16 in. below where power is divided by four pinion differential to front and rear axles. Locking arrangement on differential controlled from driver's cab eliminates differential action when solid drive to both axles is desired. Feature: Ease with which transmission may be serviced. Entire mechanism may be disassembled in 1 hr. 30 min. by two mechanics without removing transmission and transfer case from truck and without removing cab or truck body. Two-speed auxiliary transmission arranged so that selection of gear ratios in its low range may be provided resulting in gear reduction ranging from $1\frac{3}{4}$ to 1, to $2\frac{1}{2}$ to 1. With proper selection of gear ratio in auxiliary low range, truck will operate 15 to 18 m.p.h. in high gear low range, thus avoiding use of transmismission gears in such work as snow removal, except when low ratio is required.—The Four Wheel Drive Auto Co., Clintonville, Wis.

SMALL DUPLEX CRUSHING PLANT, offered to supply demand for unit to produce limited amounts of small crushed gravel, consists of jaw crusher to take large rocks and a 16x16-in. roll crusher for secondary and fine crushing. Outstanding feature: Bottom-deck feed which doubles effective screen area and balances



work of two grushers. Screens pit material on bottom deck and crushed material on top deck. Owner of this new machine has flexible plant said to meet varied conditions — he may make road gravel, reject any percentage of sand and produce "stone chips" for seal coat or cover aggregate.—Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis, Minn.



HAZARD LAY-SET Preformed Handles Easier

Whether it is on a carryall, dragline, concrete mixer, power shovel, clamshell, skip hoist—or what not—Hazard LAY-SET <u>Preformed</u> is appreciated by the workmen because it handles easier. The preforming process, back at the mill, gives it that advantage. <u>Preforming eliminates internal strain thereby making LAY-SET limber, flexible, easy to reeve. Therefore, LAY-SET resists kinking, resists rotating in sheave grooves, resists the fatigue of bending. LAY-SET requires no seizing as it won't fly apart when cut.</u>

Crown wires that finally wear through will not porcupine to tear workmen's hands and possibly cause blood poisoning. This makes Hazard LAY-SET <u>Preformed</u> a safer rope to use. Small wonder the workmen like it.

The bosses in the office like it, too, for the records reveal that Hazard LAY-SET <u>Preformed lasts longer</u>. Much longer. That means less frequent rope replacements and shutdowns—more work done.

Specify Hazard LAY-SET <u>Preformed</u> for your next line. All Hazard ropes made of Improved Plow Steel are identified by the Green Strand—and remember, Green Signifies Safety for both men and pocketbook.

HAZARD WIRE ROPE DIVISION Established 1846

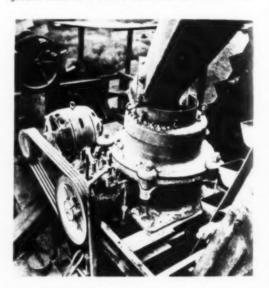
AMERICAN CHAIN & CABLE COMPANY, INC., WILKES-BARRE, PA.

District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma



PROTECTIVE PAINTS derived from rubber are claimed to have unusual properties as coverings for building exteriors and interiors, concrete floors, storage plants, factories and swimming pools. They dry by evaporation, during which solid material in said to be united to metal or any other clean dry surface with practically an inseparable bond. These paints with trade name of "Acidseal" are claimed to have many of elastic properties of rubber, hard, firm film conforming to expansion, contraction or vibration of painted surface without cracking. — B. F. Goodrich Co., Akron. Ohio.

intercone crusher said to produce ½- and ¾ in. rock at low cost, is high-speed machine with conical head which gyrates horizontally within aroutwardly flaring curved concave bowl. Materia crushed in upper zone automatically spreads over greater area as it moves downward between crush



ing strokes through lower crushing zone to discharge opening. Other low-cost operation features according to manufacturers: (1) Strong steel structure; (2) lead-bronze eccentric sleeves; (3) manganese steel wearing surfaces; (4) force feed lubrication; (5) positive protection against tramp iron; (6) simple, fast adjustment together with quick, easy replacement of wearing parts; (7) low headroom requirements; (8) simple drive.—Smith Engineering Works, Milwaukee, Wis.

ELECTRIC DRILL for metal and wood drilling up to 1/4-in. capacity is claimed to be unusually compact and to have high resistance to wear and abuse Powerful, high torque motor available in three speeds. Gear case contains one pair of helical gears. Ball bearings mounted in steel inserts. Bump



on handle will not distort bearing alignment, since there is no connection between handle and bridge supporting rear armature bearing. Air intake is on ends of handle where it will not be covered by hand or pick up dirt and chips. Oversize two-pole inclosed switch with die-cast, close fitting trigger attached. Same tool may be supplied as screwariver for No. 8 wood or 3/16-in. machine screws Also as nut runner for 3/16-in. nuts or bolts.—Chicago Pneumatic Tool Co., 6 E. 44th St., New York City





Risks are reduced when you use Primacord-Bickford Detonating Fuse. This modern, insensitive fuse cannot be set off by friction, fire or ordinary shock but must be deliberately detonated by means of a blasting cap. Since it is the detonating agent for each cartridge in the load, no caps are needed in the hole. Loading is safer, easier and quicker; danger of burned holes is eliminated; no unexploded caps or powder remain to present risks after shooting. Primacord is good protection for profits.

THE ENSIGN-BICKFORD CO., Simsbury, Conn.

Makers of Cordean-Bickford Detonating Fuse
—and Safety Fuse since 1836

PRIMACORD-BICKFORD Detonating FUSE

PB18



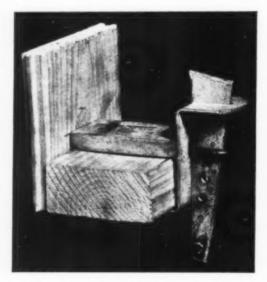






main line lengths pre knot.

FORM TIE CLAMP for concrete construction is designed to reduce use of walers for built-in-place forms and eliminate them entirely when built-up panel forms are employed. Rigid steel rod of 3/16diameter is fitted with washers at inside faces of forms to serve as combination-spreader and tie



rod. The tie clamp consists of three elements of galvanized metal, a horizontal 3½-in. length of 2-in. channel section welded to face of a vertical plate bent into shape of a Z, bottom leg of which hooks under form studding. In face of this vertical plate is a ¾-in.-diameter hole through which passes end of tierod which is bent into a U. The top leg of Z-



shaped plate is slotted to receive a metal wedge which, when driven downward, passes through shaped plate is slotted to receive a metal weage which, when driven downward, passes through opening in bent end of tierod and pulls it up tight. To strip forms, wedge is merely knocked out, clamp removed and protruding end of tierod cut off.—

Kantor Concrete Form Co., 3210 N. Troy St., Chi-

2-CYLINDER DIESEL ENGINES in three new models known as DIX series are designed for extreme simplicity, economy and reliability, Internal dimensions are as follows: (1) 3¾x4½-in. bore and stroke, displacement 99.4 cu.in., developing 24 hp. at 1,800 r.p.m.; (2) 4x4½-in. bore and stroke, 113.1-cu.in. displacement, developing 27 hp. at 1,800 r.p.m.; (3) 4¼x4½-in. bore and stroke, 127.5-cu.in. displacement, developing 27 hp. at 1,600 r.p.m. Primarily built for hand starting which is facilitated by large flywheel and decompression device built into cylinder. Counterweight mounted on crankshaft outside of crankcase said to assure ideal balance for encrankcase said to assure ideal balance for en-

ARMSTRUNG BROS.

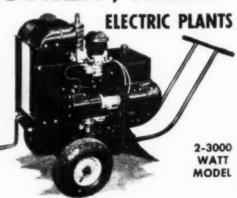
Better PIPE TOOLS Built to industrial standards for Built to industrial standards for quality tools these are better pipe tools, improved in design and action with drop forgings, alloy steels, and hardened parts wherever they will add to per-formance or life. Handier, stronger, accurately made and finely finished, they make work easier, faster. They comprise the most complete line made, still each is an improved tool. The Chain Vise has drop-forged to the complete line was the still each accordance to the complete line. Ine Chain vise has drop-rorged
I-piece (patented) jaws that
prevent crushing or bending of
smallest pipe, tubing or conduit
... the patented pipe wrench
has forged-in-lugs that absorb
all side strain and nine other

Solid Dies and Stocks (3 types) Adjustable Dies and Stocks Recoding Type Threaders (3 types) Pipe Cutter with Knife Blaste Wheels (5 types) Standard Chain and Post Vises Chain Wrenches and Tongs (5 types Pipe Wrenches Ratchet Beamers

Write today for Catalog C-39 the most complete line of Pipe Tools made.



NAN Portable



Contractors! Here is THE source of **ELECTRIC POWER you have been look**ing for — Increase Profits on Your Jobs

ONAN ELECTRIC PLANTS are HEAVY DUTY, COM-PACT, DEPENDABLE — READY TO TACKLE THE TOUGHEST JOBS. SPEED UP THOSE JOBS—INCREASE YOUR PROFITS — BE IN A POSITION TO BID ON MORE AND BIGGER CONTRACTS THIS YEAR.

ONAN ELECTRIC PLANTS furnish sufficient Power for Operation of all PORTABLE ELECTRIC TOOLS used on the Job — Drills, Saws, Grinders, Tampers, Sanders, Water Pumps, Many Others, and in addition will furnish Plenty of Light for those Night Jobs.

of Light for those Night Jobs.

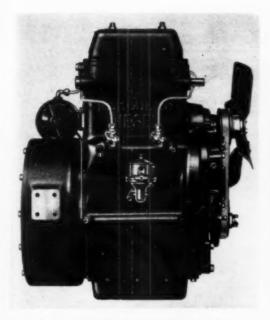
The many sizes from 350 to 50,000 Watts, enables you to choose the Plant best suited to your needs. There are Models equipped with pneumatic rubber-tired Dollies, as shown above, also types equipped with carrying Handles and Light enough for One Man to carry about with ease.

ONAN PLANTS, in Stationary and Portable Models, are used in every conceivable type of service IN ALL PARTS OF THE WORLD, and are giving DAILY UNINTERRUPTED SERVICE.

SHIPPED COMPLETE-READY TO RUN

Drop us a card or letter and let us send you Literature describing the Complete Line.

D. W. ONAN & SONS 717 ROYALSTON AVENUE . MINNEAPOLIS, MINN.



gine. Fuel pump and governor incorporated in design of cylinder block. Fuel plungers driven by engine camshaft. Inclosed, accessible flyball-type governor mounted on camshaft gear is spring loaded, an outside control lever enabling it to change tenan outside control lever enabling it to change tension of governor spring, thereby controlling engine speed within wide range. Large capacity, gear type lubricating 6-qt.-capacity oil pump, located at front end of engine and driven directly from gear on crankshaft, draws oil through screen from oil sump of engine, delivering it directly to crankshaft bearings. Bypass line conducts portion of oil through throw-away type of filter to rocker arms on top of evilinder head from which it is drained to valve and cylinder head from which it is drained to valve and fuel pump tappet compartment and allowed to return through traps into oil sump after passing through timing gear housing. Three gears in front of engine—crankshaft, camshaft and lubricating oil driving gear. Timing gear housing, tappet and rocker arm compartment are airtight, sealed from crankcase, said to prevent blow-by gases from reaching these parts and at same time avoiding dangerous condensation.—Hercules Motors Corp., Canton, Ohio.

Step-by-Step Field Methods

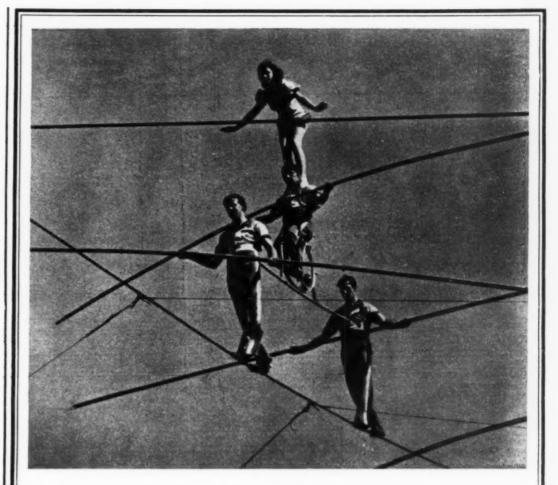
(Continued from page 75)

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25

engine truck chassis, is rated at 161/2-tons capacity and is equipped with an Ingersoll-Rand air compressor which is used for supplying pavement breakers, spades, wrenches and other pneumatic equipment. A speed up to 35 m.p.h. is available to cover the large territory in which manholes are installed by the Edison company. The bucket, an Owen clamshell of 3/8-cu.yd. capacity, is sufficiently small to enable it to pass easily inside the walls of the smallest manhole used.

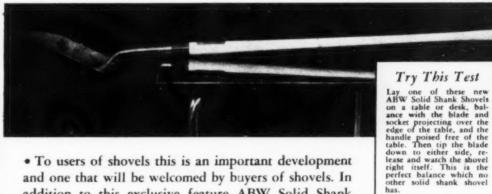
As a result of experience over a period of 16 months during which 165 caisson type manholes were installed, Mr. Scofield presents the following conclusions: (1) The caisson method of construction is practical. (2) Economies of the order of 20 to 35 per cent have been achieved by using the new method; these economies are expected to increase as further experience is gained. (3) The caisson method of construction is conducive to safety. (4) The hindrance to traffic during construction has been greatly reduced.



PERFECT BALANCE

The four tight rope walkers shown above, must have perfect balance to successfully perform their breath taking act. Just as their work depends upon this perfect balance so does the work of a shoveler depend upon balance in his shovel. Balance in a shovel means easier handling and more efficiency in shoveling. A new re-designed socket gives to the ABW Solid Shank Shovel a perfect balance. The new high bend has achieved for this famous shovel a balance unequalled in any other solid shank shovel.

New Redesigned Socket



 To users of shovels this is an important development and one that will be welcomed by buyers of shovels. In addition to this exclusive feature ABW Solid Shank Shovels are equipped with the famous Shock Band which gives more handle strength to the shovel. ABW Solid Shank Shovels are made from one solid bar of steel.

ABW PRODUCTS

Try This Test

Shovels Spades

Rakes Post Hole Diggers Agricultural Handles



AMES BALDWIN WYOMING CO.

PARKERSBURG, W. VA.

Ask your Jobber

NORTH EASTON, MASS.





420 cu. ft. diesel-driven Schramm Compressor easily operates 4 rock drills or 2 wagon drills.

Schramm builds a complete line of portable and stationary air compressors — 40 to 420 cu. ft. (actual air delivery) on all mountings - costing not as much as you might expect! Write for descriptive literature.

SCHRAMM, Inc.

902 E. VIRGINIA AVE. WEST CHESTER, PA.

Established 1900

CONSTRUCTION EQUIPMENT

NEWS ... Continued

ELECTRIC AERIAL GRINDER, available in 1- 11/2and 2-hp. portable and 2½-hp. suspended aerial sizes, is equipped with Sawyer's two-pole, polyphase motor which eliminates commutator brushes and centrifugal switches and, combined with moderate rotor speeds, is said to assure low maintenance cost. Motor totally inclosed to prevent grind-



ing dust from entering stator. Standard, double shielded factory-lubricated type bearings. Rotor is integral part of shaft and this unit, mounted on antifriction ball bearings is only rotating part. Grinder specifications on all sizes involve 220-v., 3-phase, 60-cycle motor, and speed of all sizes, with exception of high-speed gear drive machine, is 3,600 r.p.m. High-speed unit geared to drive at 5,400 r.p.m. Weights vary from 16 lb. on 1-hp. machine to 65 lb. on suspended 3½-hp. unit.—Sawyer Electrical Mig. Co., 5715 Leneve St., Los Angeles. Calif.

EXTRA HEAVY-DUTY ROOTER, 9,150 lb., designed to speed Carryall production, and to extend scraper efficiency into rock, shale and hardpan, is equipped with three removable teeth capable of digging to depth of 28 in. To assure easier penetration of hard material, center of each tooth is set ahead of others



and ends of rooter shanks are built at steeper angle than formerly used. Teeth are hard-faced and self-sharpening for natural digging suction and fit like caps on end of shanks, said to prolong life and permit faster, easier rooting. Bumper frame, mounted on rear, said to provide pusher-tractor action in toughest material and to increase weight of rooter for digging.—R. G. LeTourneau. Inc., Peoria, Ill.

STEEL VALVE without bonnet-joint has been developed to end leakage through gasket joint between valve body and bonnet at elevated pressures and



temperatures. Of partemperatures. Of par-ticular value in oil, chemical and other industries handling explosive fluids where hazard of leak-

care of 90 per cent of small valve requirements on industrial jobs.—Manning. Maxwell & Moore, Inc., Bridgeport, Conn.



Hard at work on construction jobs in scores of shovels, cranes, trucks, tractors and stationary applications, the GM Diesel is setting new standards of performance, economy and dependability wherever it is used.

NYONE who figures construction jobs knows how tough it is to keep bids down and still make money.

Well, that's where the GM Diesel can help you-just as it's helping other contractors and construction engineers.

We needn't tell you about the Diesel's economy and how it stops fuel pilferage. All Diesels have those features.

But the GM Diesel goes a great deal further. It's actually outperforming gasoline engines, and other Diesels in construction work!

Using the General Motors 2-cycle principle—this engine packs more power per pound-has better lugging ability, faster acceleration, and a new responsiveness to meet varying load demands-which means more production per hour.

DIESEL POWER

In short, on construction jobs of almost every sortin tractors, cranes and shovels-with compressors,

pumps, ditchers and crushers-it's getting more done in less time and showing record reliability as well.

That's why you'll find the GM Diesel working for contractors who place low bids yet make high profits.

And that's why you'll want to learn firsthand what GM Diesel power might do for you. Specify GM Diesels on your equipment. Your manufacturer has the facts. Or, for further details, consult the GM Diesel dealer in your vicinity.

Write for his name and address to

Dept. M DIESEL ENGINE DIVISION General Motors Sales Corporation Cleveland, Ohio



TAKES THE ADVANTAGES OF A CENTRAL MIXING PLANT TO EVERY JOB AT UNBELIEVABLY LOW COST!

A great labor and money-saver for contractors, products and pipe plants. With CMC 10S or 14S Mixer makes an unbeatable combination. Scale has beam for each aggregate. Ideal for charging small transit fleets or dry batching trucks. Bins can be loaded by crane or conveyor, or on some jobs can be set up for direct truck deliveries from ramp, side hill or batching unit only. Trailing trucks available if desired. Get the facts today on this NEW PIECE of moneymaking equipment. Exclusive with CMC.

New CMC Hoists

—low priced—high
quality. Single and
double drum up to
40 H.P. More economical to own —
safer to use.

New CMC Dual Prime and Well Point Pumps. Most efficient and complete line in the industry. All sizes for all purposes.

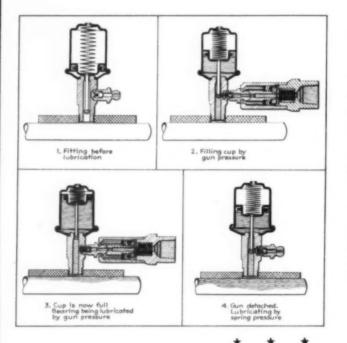
> Get the CMC Catalog just out showing the very latest in Concrete, Plaster, Mortar and Bituminous Mixers, Pumps, Power Saws, Hoisting and placing equipment. Carts and Barrows.

CONSTRUCTION MACHINERY COMPANY WATERLOO, IOWA

TRACTOR-TRAILER UNIT for level quarry operations consists of Mack EG tractor having $132\frac{1}{2}$ -in. wheelbase and engine with $3\frac{4}{3}$ -in. bore and stroke, and an Easton Car and Construction Co., Phoenix type $9\frac{1}{2}$ -cu.yd. capacity side-dump trailer. Tractor has smaller engine than would be used for road operations



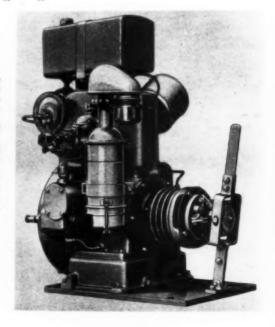
but has been built to withstand rough going and hard knocks of quarry operation by use of oversize axles, springs and tires. Trailer has no integral hoist, body being tipped by lift installed at unloading point. Transferring hinge arrangement and outriggers on trailer assist in side dumping. Ends of outriggers contact apron over which load spills at discharge, relieving springs of abnormal stresses.—Mack Trucks Inc., 34th St. & 49th Ave., Long Island City, N. Y.



HYDRAULIC RESERVOIR CUP used with Alemite for on-the-road replenishment of grease in heavy-duty motor car bearings provides automatic, constant and controlled flow of grease or semi-fluid oil to king pins, spring shackles and other bearings subject to heavy wear, thus decreasing frequency of periodic greasing of all bearings with consequent delays and expense. Operator fills cup with lubricant through Alemite fitting on side, an automatic, patented shut-off valve protecting reservoir from damage from high pressures. When reservoir is filled, valve closes automatically, remainder of lubricant flowing to bearing, flushing it clean of old grease. Removal of gun seals litting and bearing against moisture and grit. While vehicle is in motion bearing receives constant supply of lubricant by action of spring and piston on stored grease or oil.—

Stewart-Warner Corp., 1828 W. Diversey Parkway. Chicago, Ill.

AIRCOOLED GASOLINE ENGINE, 5.5 hp., for use especially on pumping jobs where horsepower requirements are low, is designed for efficient service with minimum of attention. Unit is 1-cylinder, 4-cycle, vertical type with 3½x4-in. bore and stroke, piston displacement, 41.2 cu.in., full load speed of 800 to 1,800 r.p.m., and piston speed of 1,067 f.p.m. Oil-bath-type air cleaner. Drop forged, heat treated and counterweighted crankshaft with adjustable tapered roller main bearings. Pump and splash lubrication. Crankcase capacity, 4 qt. Fan cast integrally with flywheel and heat radiating fins cast on cylinder block. Gasoline tank capacity, 2¾ gal. Dry, over-center type clutch. Weight, 445 lb.—Caterpillar Tractor Co., Peoria, III.





The powerful chain crowd on the ½-YARD HK INSLEY . . . and a faster retraction is made possible by the reversible two-speed front drum. Note the exceptionally heavy, rugged construction in the illustration above . . . the hook roller construction . . . the large brakes for easy control. Efficient

internal expanding clutches assure delivery of all of the engine's power to the pull of the rope.

These are but a few of the features that should make the %-YARD INSLEY HK a profitable investment for you. Write for the whole story...ask for Bulletin No. 146.

The % and ½-yard Insley moves faster, swings faster (6½ rpm.), travels faster and produces more yardage at a lower yardage cost than many heavier machines of larger rated capacity.

INSLEY MANUFACTURING CORPORATION, INDIANAPOLIS, INDIANA

Build Better Bulkheads with corrugated steel sheet piling

• This bulkhead at Hamburg, Conn., was constructed of No. 8 Gauge Interlock Type Corrugated Steel Sheet Piling with oak wales on both sides through bolted. Tie rods were installed every 10' tied back to a Corrugated "dead man" buried in the ground and the top was capped with 12 x 12 concrete to level of top wales.

Corrugated Steel Sheet Piling can be used with equal effectiveness on such jobs as sewers, dams, levees, cofferdams, sewage disposal plants and bridges. It is strong, light weight, watertight, easy to handle and transport, and has high salvage value.

Use Corrugated Piling for greatest efficiency and economy. Write today for catalog. Address request to Dept. CM-3.



IN TWO TYPES





THE UNION METAL MANUFACTURING CO.

SMALL LIGHTWEIGHT PORTABLE ELECTRIC SAW, with combination 6½-in, crosscut and ripsaw blade and with cutting capacity of 1½ in., said to incorporate outstanding features of higher priced tools, is of particular interest to carpenters, builders, and contractors on garages, small houses and re-



modeling work. Cuts full 2-in. dressed lumber on straight cut and 1 11/16 in. on 45-deg. angle cuts. Self-releasing, quick make-and-brake type switch. Special alloy chrome nickel steel hardened gears. Grip handle and trigger switch. Spring operated safety guard. Heat-treated aluminum alloy rip fence guide, adjustable 0 to 5 in. Standard equipment: One combination crosscut and ripsaw blade; 25 ft. of three conductor rubber cord with two-prong plug; all steel carrying case and one tube of lubricant. Mall Toel Co., 7740 S. Chicago Ave., Chicago, Ill.

DIRECT DRIVE ELECTRIC SPRAY PAINTING OUTFIT, for medium and light duty service, is operated by $\frac{1}{3}$ -hp. motor to which is directly connected piston-type compressor with displacement of 4.58 c.f.m., with $\frac{2x1}{2}$ -in. bore and stroke and maximum



working pressure of 40 lb. Fan-type counter-baranced flywheel reduces vibration to minimum and assures proper cooling. Finned air chamber relieves pulsation and serves as oil and moisture separator. Unit provided with safety and drain valves and connection for hose. Electric cord 12 ft. long with plug and switch at motor for convenient operation at light socket. Supplied with three different assemblies of spray equipment for easy selection suited to all types of medium or small painting or finishing jobs.—DeVilbiss Co., 300 Phillips Ave., Toledo, Ohio.

STREAMLINED PORTABLE COMPRESSOR. 85-cu.ft. capacity, is fitted especially for work requiring quick transport to job and easy handling while in use. On skids it is said to be compact enough to mount crosswise of truck body behind cab, leaving rest of space for other equipment. Features: (1) Two-stage compression, saving gas and insuring operation well below carbonizing temperatures; (2)



How to buy a truck that exactly suits your needs

Among Chevrolet's great variety of 1940 trucks-now 58 models on nine wheelbases-it's easy to find the one that best fits your hauling job.

First, narrow your choice down by determining what weight capacity you require. (Chevrolet offers you a choice ranging from the speedy Sedan Delivery to Heavy Duty units of 14,000 pounds gross weight.)

Next, pick the wheelbase that meets your garage or loading space, body length or turning radius. (Chevrolet Heavy Duty chassis come in five wheelbases, from 1075% inches to 1581/2 inches.)

Do you want a Cab-Over-Engine truck, or a conventional model-or a Dubl-Duti package delivery type? (Chevrolet builds them all.)

Finally, you have your pick of a great variety of Chevroletbuilt bodies specially designed for specific types of work . . . or you may buy a Chevrolet chassis either complete with cab or with flat-face cowl ready for your special body.

There are few trades and industries that Chevrolet cannot provide with trucks that fit their requirements... which is one of the reasons why Chevrolet held a 31.4 per cent lead in sales over the next largest builder in 1939.

CHEVROLET MOTOR DIVISION • General Motors Sales Corporation • DETROIT, MICHIGAN

ONLY CHEVROLET TRUCKS BRING YOU ALL THESE FAMOUS FEATURES

NEW DE LUXE TRUCK CABS . CHEVROLET'S FAMOUS VALVE-IN-HEAD TRUCK ENGINE NEW HYPOID REAR AXLE . EXTRA-STURDY TRUCK FRAME . NEW FULL-VISION OUT-LOOK AND NEW CRYSTAL-CLEAR SAFETY PLATE GLASS WINDSHIELD . PERFECTED HYDRAULIC TRUCK BRAKES . SPECIALIZED 4-WAY LUBRICATION . NEW SEALED BEAM HEADLIGHTS (with separate FULL-FLOATING REAR AXLE (on Heavy Duty models)

(Vacuum-Power Brakes, 2-Speed Rear Axle optional on Heavy Duty models at extra cost.)



More than ever, the "THRIFT-CARRIERS FOR THE NATION"

CHEVROLET TRUCKS

If You're Looking for Ways to Cut Air Job Costs...



"GJ-DIXON"

GROUND JOINT

AIR HAMMER COUPLINGS

The ground joint feature makes these dependable couplings particularly economical from the standpoint of service maintenance. No leaking, lost or wormout washers to replace. Soft-to-hard metal seat forms permanently tight seal, regardless of wear. Exceptionally strong and durable. Cadmium plated—russproof, Furnished with either male or female spud. Compact type, Style XLD-41, ½" and ½"; heavy type, Style XHD-52, ¾" and 1".



AID HAMMED COURLINGS

AIR HAMMER COUPLINGS

The use of these couplings assures safe, trouble-free service out of all proportion to their low cost. Designed for use on all makes of hand hammers and rock drills. Simple construction—strong and durable—easily installed. Cadmium plated—rustproof. Compact type, Style WLD-7, ½" and ¾"; heavy type, Style WHD-9, ¾" and ½".



"GJ-BOSS"

GROUND JOINT

AIR HAMMER COUPLINGS

The most efficient couplings ever devised for air equipment. Same as "G J-DIXON" Air Hammer Couplings described above, except that they are designed for the most severe types of service by application of the sturdy, malleable iron "BOSS" Clamp, the fingers of which engage a collar on the special steel stem. This arrangement eliminates any possibility of a blow-off, regardless of conditions. Cadmium plated—rustproof. Compact type, Style XLB-61, ½" and ½"; heavy type, Style XHB-72, ¾" and 1".

"BOSS" AIR HAMMER COUPLINGS

Generally, these are the same in design and construction as the "DIXON" Air Hammer Couplings, with the same steel spud and malleable iron wing nut. Like the "G J-BOSS", however, they are equipped with the strong malleable iron "BOSS" Clamp, providing the exceptional gripping strength required for maximum safety and efficiency on the toughest air hose operations. Cadmium plated—rustproof. Compact type, Style WLB-21, ½" and ½"; heavy type, WHB-32, ¾" and 1",

Stocked by leading Rubber Manufacturers and Jobbers

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water-jacketed compressor cylinders maintain even temperature for proper lubrication summer or winter; (3) oversize twin-disk clutch permits easy cranking; (4) reserve power 55 per cent; (5) carefully designed to keep weight down; (6) roller-bearing two-wheel spring trailer for high speed towing to and from job with conveniently arranged stabilizing



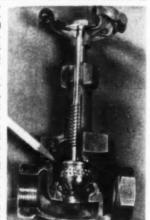
legs to steady machine and prevent creeping when operating. Compressor has $6\frac{3}{4}x4\frac{1}{2}$ -in. (low pressure) and $4x4\frac{1}{2}$ -in. (high pressure) bore and stroke and operates at 1,250 r.p.m. with 100-lb. working pressure. Powered by Hercules 6-cylinder gasoline engine, $3\frac{1}{6}x4\frac{1}{6}$ -in. bore and stroke operating at 1,250 r.p.m. Twin-disk clutch; sectional radiator; all-steel frame; 14x40-in. air receiver; 12-gal. fuel tank; dimensions $128\frac{1}{2}x64x59\frac{1}{2}$ in.; net weight, 2,750 lb.—Gardner-Denver Co., Quincy, III.

HARD-FACING ROD, new alloy Haynes "93" welding rod for hard-surfacing welding parts, is recommended by its makers for use where severe abrasion, accompanied by moderate amount of impact, is encountered. Especially successful for use on dredge pump impellers, cement clinker crushing rolls, slag crusher roll teeth, cinder crusher rolls, tamper feet for cinder block manufacturing, tube bending mandrels and other parts subjected to wear. Rod is of ferrous composition and contains chromium, molybdenum, cobalt and other alloy elements amounting to more than 40 per cent. Tensile strength, 43,000 lb. per square inch and hardness, as deposited by oxyacetylene welding, of 62 Rock-

well C. When deposits are heat-treated by heating to 1,950 deg. F. and then air-cooled, hardness reaches 66 to 67 Rockwell C. Haynes rod may be applied either by oxyacetylene or metallic arc process, and is said to be readily handled under oxyacetylene flame. When new rod is applied by metallic arc process, reversed polarity is used, and flux-coated rods are recommended.—Haynes Stellite Co., Ko-komo, Ind.

NON-LEAK VALVE involving new principle of steam control, invented by Joel Ostlind, Swedish mechanical engineer now a citizen of the United States, is

cal engineer now a c
equipped with spinning disk, which rotates up to 2,000
r.p.m. for moment preceding closing. Disk
does not spin when
valve is "cracked,"
or while throttling.
Reversing chamber
directs steam flow to
turbine vanes just
before disk descends
into seat. Turbine
vanes are shielded
from steam flow when
valve is open. Spinning disk throws off
scale and other foreign particles by centrilugal force, thereby
preventing particles
from becoming
caught in line of



from becoming caught in line of seating. Disk hits seat while spinning at high rate of speed, and consequently polishes line of closure, creating a complete metal-to-metal contact between seat and disk, thus preventing "wire-drawing." Disk is mounted on spindle against a stainless steel ball bearing, aligning disk with seat when closing. Valve is equipped with two separate seats, one for closing and one for cracking and throttling. Valve is cracked and throttled against side of disk from throttling seat, protecting line of closure from destructive action of high velocity steam, and also preventing scale from sticking at line of closure during operation. Valves are built in sizes from ½ in. up.—Ostlind Valve, Inc., Portland. Ore.

DIESEL CRAWLER TRACTORS, three new models, have been added to TracTracTor line, offering to market four machines with drawbar horsepower ranging from 30 for the smallest 70 for the largest. Each machine is equipped with full diesel engine. Two models, TD-6 and TD-9, have five forward and one reverse speeds; two others, TD-14 and TD-18, have six forward and two reverse. Selective type of transmission in combination with variable speed type engine governor said to make possible close selection of correct speed and economical use of power on various loads from slow, heavy pulls or pushes to fast re-



turn hauls. TD-18 has 6-cylinder engine and three smaller models are powered by 4-cylinder units. Replaceable cylinder sleeves. Tough alloy iron, well-ribbed and braced engine block. Drop forged alloy steel crankshafts. Other features: (1) Heavy, one-piece main frame; (2) track frame and stabilizer construction assures free oscillation and positive alignment of tracks and maximum track-to-ground contact, permitting higher traveling speeds; (3) over-center clutch with low-inertia driven members and automatic clutch brake for fast gear shifting; (4) adjustable steering levers and pedals; (5) track shoes keyed to track links to eliminate loosening of shoes; (6) full pressure engine lubrication by multiple-gear oil pump; (7) thermostat-controlled centrifugal pump cooling system; (8) quintuple-sealed track rollers to keep out dirt; (9) large, fully upholstered innerspring seat, with upholstered back and arm rests for operator comfort. — International Harvester Co., 180 N. Michigan Ave., Chicage, III.



The extra pay load of every cycle gives you extra profits on every job. Get a Red Arch dragline bucket (equipped with the new Red Arch chain) and convince yourself that these buckets are better shaped to dig faster, are lighter to save more of your power for dirt-moving, are better balanced to carry higher heaps, are smoother flared and unobstructed to dump faster, and are strong and sturdy to stand up with less time-out. Try Red Arch. You save on maintenance and increase output — that means more profit for you!

Bucyrus Erie

FOR CONCRETE REASONS

Contractors Prefer STERLING WHEELBARROWS



FOR concrete work, Sterling Models S-17, S-18 and S-19 are selected by leading Contractors because of these outstanding features:

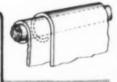
Perfect Balance 10-Spoke Wheels Self-Lubricating Bearings Heavy Tray Rod Welded Trays Malleable Wheel Guards Channel Steel Legs Square-Bent Leg Shoes Interchangeable Parts Malleable Iron Wheel Brackets Hard Maple Handles

Capacities, 3, 31/2 and 4 cu. ft. struck. Complete stocks available from Warehouses and Distributors in principal cities.

STERLING WHEELBARROW COMPANY MILWAUKEE, WISCONSIN

An Exclusive Sterling Feature

Where tray sheets lap, both thicknesses are folded over the continuous butt-welded reinforcing rod. thus giving additional rigidity and







BIG VOLUMES OF CONCRETE

FASTER DISCHARGE

You merely tilt the drum and let gravity pour out the entire batch . . . the quickest and most practical method of discharge-like emptying a pail.

Recent improvements in design and construction place the Smith Tilter further ahead than ever. Three of these improved 2-yard mixers were just recently shipped to the T. V. A. for the Watts Bar Dam in Tennessee. Another one just sent to the U.S. Reclamation Department for the Parker Dam. All sizes up to 4-yard. Write for catalog.

All-time Concrete Pouring Records were established by Smith Mixers at Boulder Dam, Marshall-Ford Dam, Norris Dam, Radford Dam, Tygart Valley Reservoir and other World Famous Projects.

THE T. L. SMITH COMPANY 2851 N. 32nd Street . Milwaukee, Wis., U.S.A.



USED ON THE WORLD'S GREATEST CONCRETE PROJECTS

PASTE SOLDER, marketed under name of "Melto PASTE SOLDER, marketed under name of Melto matic Paste Solder", is said to simplify processes of soldering and tinning, dispensing with usual paraphernalia needed on this type of work. Meltomatic is brushed on metal where needed and can be heated by gas, electricity, hot oil or in furnace



Melts at temperature slightly higher than 400 deg. F.—even with heat of lighted match. Advantages: (1) Saves time—surface of metal need not be cleaned before application of Meltomatic; (2) no waste—no excess to melt and drop off; (3) since material is brushed on, it is evenly distributed, assuring solid contact; (4) no corrosion of adjacent surfaces, thereby eliminating work of cleaning rust spots.—Wayne Chemical Products Co., Detroit, Mich.

EMERGENCY JACK, lightweight, single acting, automatic raising and lowering tool, has capacity of 5 tons, meeting demand for smaller tool of this type, with all features of 15-ton models. Tilts on base when base pawl is disengaged, permitting angular jacking or pushing and pulling. Lifts on cap, auxili



ary shoe, toe lift and at any intermediate point by using 4½-1t. 7/16-in. chain which is fitted with grab hook as sling. Has strong inner-ribbed base, double hook as sing, has strong inner-fibbed base, adubte lever socket for operation in close quarters and machine-corrugated toe lift. Weight, 64 lb.; height. 22 in.; 14-ft. lift. Furnished complete with $4l_2$ -ft chain, an auxiliary cap shoe and 36-in. heat-treated steel lever bar. — Templeton, Kenly & Co., 1020 S. Central Ave., Chicago, Ill.

SELF-PROPELLED EARTH MOVER, new high speed SELF-PROPELLED EARTH MOVER, new high speed unit for moving earth on road, dam and other large scale operations is said to cut hauling time and distance practically in half. Rated capacity, 15 cu.yd. Powered by 6-cylinder, 100-hp. diesel engine which operates on less than 3 gal. of fuel oil per hour. Speed, 25 m.p.h.; short turning radius of 15 ft. Air-controlled steering, brakes and clutch. Other operations governed by finger-tip hydraulic



"HERCULES" (Red-Strand) Wire Rope owes much of its outstanding performance record to the many rigid tests that must be undergone and survived, even before its actual manufacture begins.

In reality our entire plant is a proving ground from receiving door to shipping platform. Following the thorough testing of all materials, exacting inspections are made by experienced workmen during each step in the process of manufacture.

Your proving ground for wire rope is where you use it. Because of our accurate control of quality during manufacture, you can depend on "HERCULES" (Red-Strand) Wire Rope for maximum operating economy. And it is on the job . . . your proving ground . . . where "HERCULES" has won and where it continues to maintain its enviable reputation.



Style G Flattened Strand



6x19 Filler Wire



6x19



6x37

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS 5909 KENNERLY AVENUE

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The illustrations at the right show a few of the

many constructions in which "HERCULES" is

available. All can be furnished either Standard or Preformed. We would welcome the opportunity to recommend the construction and type we consider most suitable for your

conditions.



ST. LOUIS, MISSOURI, U.S.A.

SAN FRANCISCO 7 520 Fourth Street
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Whatever the job—wherever its location—today's best working hat is Skullgard! M.S.A. Skullgards give you the easy comfort of an old felt hat with the rugged headshielding strength of laminated bakelite—sturdy protection against the hazards of falling materials, bumps, blows and jars that may occur on any job . . . non-deteriorating from the effects of exposure to water, oil or perspiration—non-conductive to electricity, lightweight and well vertilated. well ventilated.

And now, M.S.A. provides new versatility for America's standard work hat . . . specific new convenience as well as protection for Skullgard users who must wear goggles, and for welders who need Skullgard's safety!

Study the briefly-described Skullgard assemblies below ... and let us arrange to show them to you at your convenience! We'll be glad to do so, without obligation of any kind.



THE M. S. A. COMBINATION SMULLCARD-WELDING SHIELD provides finest head protection with a one-piece easy-tilting welding shield of modern design. Shield swings up out of way at will, and is quickly detachable, permitting the Skull-gard to be worn separately for other work when desired.



THE M. S. A. COMBINATION SKULLGARD-GOGGLE ASSEMBLY supplies new ease and comfort for the worker who should and does wear protective goggles on the job. An adjustable elastic in the Skullgard's brim holds the goggles in proper position without pressure or binding on temples, ears, or bridge of nose. The wearer is freed from all discomfort, and is under no temptation to remove the goggles while their protection is required.



THE M. S. A. WELDERS' EAR PROTECTORS keep sparks and flying particles out of ears, com-pleting 100% protection. Wire mesh provides ventilated comfort; ear-muff-type spring holds nit in proper position.

SAFETY APPLIANCES BRADDOCK, THOMAS & MEADE STREETS, PITTSBURN, PA. District Representatives in Principal Cities



control. Scientific distribution of weight with drive in rear said to provide satisfactory flotation on soft dumps and fills. Two of three pneumatic-tired wheels powered to reduce rolling resistance to minimum. With aid of pusher tractor when digging, power and speed at cutting edge are doubled and earth is kept boiling in bowl without customary pumping action. Thus, it is claimed, more yardage is handled in half time otherwise required. Gravity dump combined with positive ejection speeds up dumping and spreading operations.—The Galion Iron Works & Mig. Co., Galion, Ohio.

PORTABLE TELEPHONE SYSTEMS, battery operated, for intercommunication on construction where electric current is not available is claimed to be time saver and efficient aid for architects, engineers, and others engaged in this type of work. Since Twin-



phone Master station operates on its own power, it can be carried anywhere on job to give instant two-way contact with office or any other location. Sub-stations may be high-powered trumpet types or regulation office models. Calls may be originated at all stations. Workman can both hear and answer questions addressed to him without dropping tools, thus saving time and speeding dispatch of needed information.—Executone, Inc., 415 Lexington Ave... information.—Exe

STREAMLINED INCLOSED CAB is now available for use on patrol sweeper, thus assuring comfort and protection of operator at night and during cold



weather. Manufacturers claim that use of cab will not impair visibility of operator. Two doors make entrance possible from either side, and upper windows in doors can be raised or lowered at will.

—Austin-Western Road Machinery Co., Aurora, Ill. Acknowledged the QUICKEST MOST THOROUGH MOST ECONOMICAL Method of Highway STABILIZATION



PULVI-MIXER

WHETHER THE HIGHWAY JOBS ARE

- Bituminous
- 5. Tar 6. Sand Clay

- 2. Soil-cement 3. Emulsions 4. Cut Backs

THE SEAMAN PULVI-MIXER gives a more thorough, more economical in-place mixture of road materials.

A new but experience-proved method. A sensation when shown at the Road Show. Recom-mended by highway engineers. Pioneered by

Complete information on performance and costs available. Write for it.

SEAMAN MOTORS 305 N. 25th St.



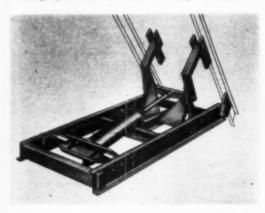
SIX NEW LINES OF TIRES for off-the-highway service, especially in mud and snow comprise: (1)
"Truck-Bus Super Traction" tires which have broad-



er, flatter treads with deep self-cleaning design for sure footed traction in mud and gumbo; (2) "Heavy Duty" for use on fire apparatus, concrete batch trucks and other heavy equipment; (3) "Commercial" for use on ½- and ¾-ton delivery trucks; (4) "Tractor Grader" for graders and other road maintenance machinery; (5) "Heavy Duty" for 1½-ton trucks and (6) "Trailer Type" for free rolling wheels on scraper wagons and other heavyduty earth moving equipment. All said to have re zone and new Hi-Flex

ment. All said to have triple protection at failure zone and new Hi-Flex tire cord, giving added strength to carcass.—B. F. Goodrich Co., Akron. Ohio.

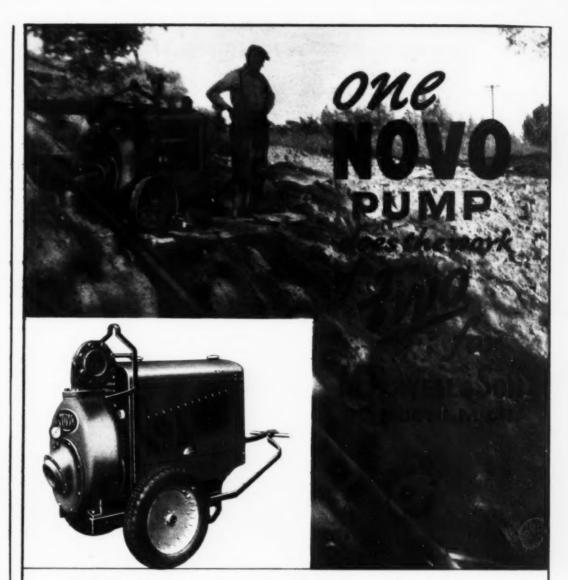
HYDRAULIC HOIST, double-arm-type lift, is said to be fast, powerful, low-pressure hoist with lift point well forward and centralized under load. During loading operation arms lift vertically to bottom of



body. Low loading height also is feature. Bottom of box 11 ft. from truck chassis frame which is minimum distance necessary for tire clearance. Another improvement: "balanced" valve which enables hoist to be operated by button control on dash. Especially adaptable for use with boxes of local manufacture.—Anthony Co., Inc., Streator, Ill.

HEAVY-DUTY AIR COMPRESSOR REPLACEMENT UNIT, designed to replace Ford V-8 engine in Ford truck or similar applications, comprises 4-cylinder engine and 4-cylinder compressor on 8-cylinder block. Ford engine is removed from truck and combined engine and air compressor are replaced under hood. No payload space is used by power takeoff and compressor on rear of truck, and same engine power cylinders are used for driving both truck and compressor, manipulation of several controls in cab accomplishing conversion without stopping engine. Unit delivers 55 cu.ft. of air per minute at 100-lb. pressure, sufficient to operate one heavy-





• When large excavating contractors like M. Powell & Son hit a wet sewer job, they want quick action in drying it up. The 6" centrifugal and 4" double diaphragm pumps they put on this job flopped miserably. (We're not mentioning any names, but they were not Novos.) Here's when Mr. Powell called in the W. H. Anderson Company, Inc., Novo Distributor in Detroit. They furnished him a Novo heavy-duty 4" Self-priming Centrifugal Pump which walked off with this job with ease. In fact, it only required 3½ to 4 hours operation in the morning to dry up the excavation; then, several 30 minute operating periods throughout the day kept it dry.

Look at that suction lift! 25' of suction pipe; yet, the Novo Pump primed quickly and pumped its full capacity. If you don't think Mr. Powell is sold on this Novo, just ask him!

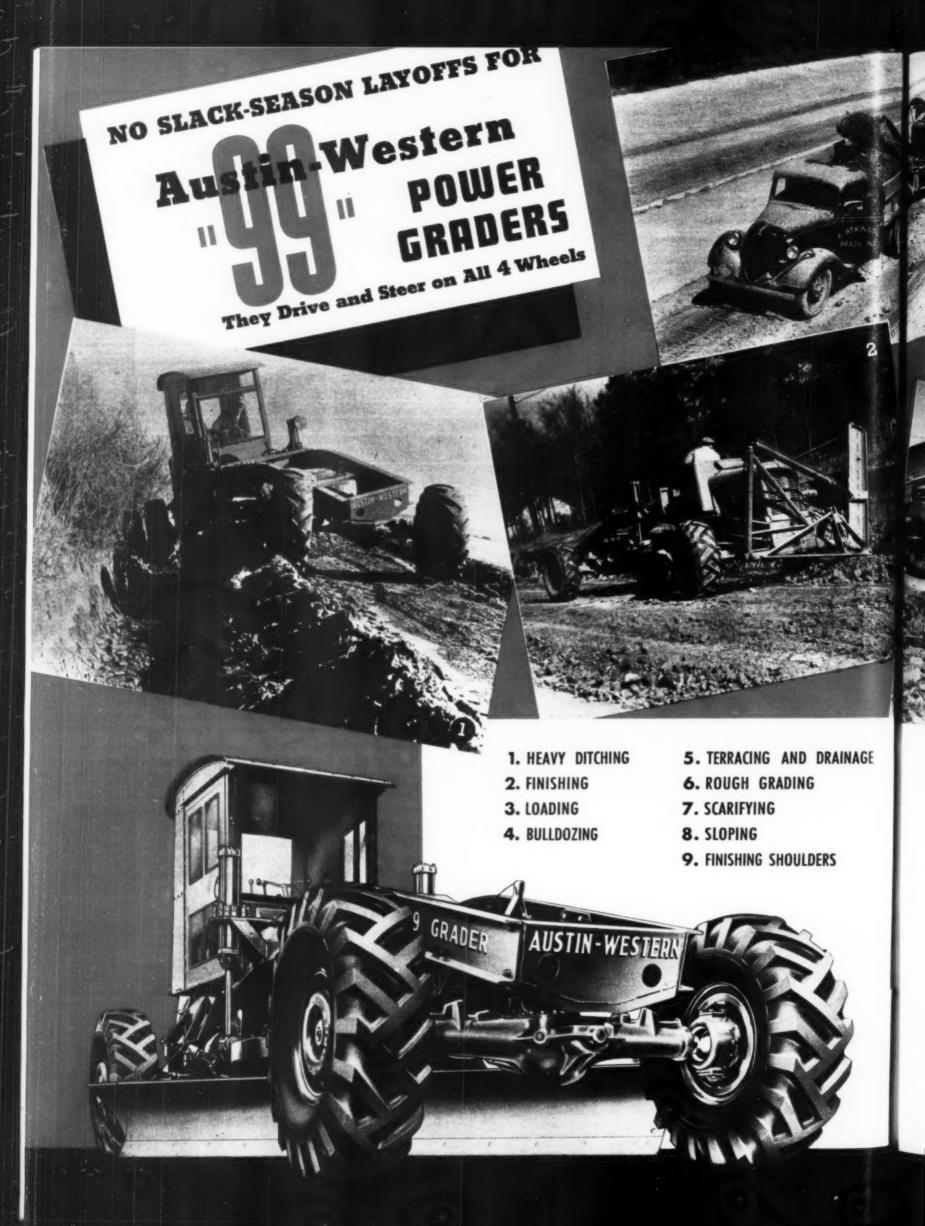
There are 10 sizes of Novo Self-primers from brief case size, $1\frac{1}{2}$ ", 3,000 GPH, to the giant capacity, 125,000 GPH, 8". All gasoline or electric powered. They have not one, but two, wear plates, one on each side of the impeller — easy adjustment for wear.

SEND THAT COUPON



Address State

NOVO ENGINE COMPANY LANSING, MICHIGAN





SOON YOU'LL HAVE TO STEP ALONG ON LOTS OF JOBS LIKE THESE...

... but you can always bank on a head start, with a "99"... and it makes no difference whether the ground is softer, the ditches deeper or the banks higher; or whether it's fills, subgrades, surfacing or shoulders.

The reason is LIVE POWER in every "99" wheel combined with REAR WHEEL STEER. Live power and a rear steer that stubbornly holds grader against the work; that offsets the frame to sidestep windrows; that neutralizes side draft and whose teamwork with other "99" features enables this powerful ma-

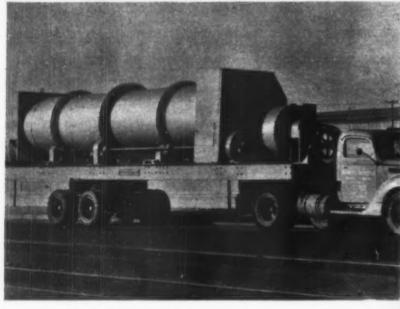
chine to move bigger bladefuls faster and farther.

It's real economy to use a "99"—it can do so many things so much better—and when it comes to cutting fuel costs, holding down upkeep and dependable day in and day out service—the "99" takes front rank position. Look into this machine; try one out on your jobs. You will be pleased and surprised at its performance. The Austin-Western Road Machinery Co., Aurora, Illinois.



In stock at New York, Philadelphia, Baltimore, Atlanta, Hartford and Los Angeles GEORGE HAISS MFG. CO., INC., 139th ST. & CANAL PLACE, NEW YORK-DISTRIBUTORS EVERYWHERE





Semi-Trailer Mounting On This Large Capacity Dryer Insures Economical Moving and Set Up Cost Without Investment In **Expensive Running Gear**

HETHERINGTON & BERNER ENGINEERS AND MANUFACTURERS

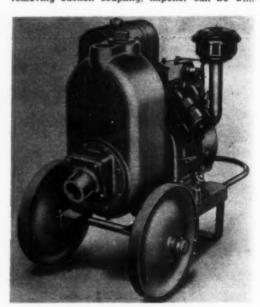
701-745 KENTUCKY AVENUE

INDIANAPOLIS INDIANA

duty paving breaker or two small demolition breakers, two backfill tampers, two clay spades, five or more spray guns, sand blast, several rotary equipment tools and many other air tools. When operating as truck, four power cylinders drive truck through standard Ford clutch and transmission, and through standard ford clutch and transmission, and four compressor cylinders are shut off so that no power is consumed and no air compressed. Of especial interest to utility companies, small contractors, paint sprayers, boiler and tank repairmen and similar users of heavy-duty compressors.—

Schramm. Inc., West Chester, Pa.

HEAVY-DUTY, SELF-PRIMING CENTRIFUGAL PUMP has as its outstanding feature, its accessibility. By removing suction coupling, impeller can be with



drawn from pump without unfastening any other plates or parts. Made in standard sizes: 2-in., 10,000 g.p.m.; 3-in., 20,000 g.p.m.; 4-in., 40,000 g.p.m.; 6-in., 90,000 g.p.m.; 8-in. 125,000 g.p.m. All models mounted on disk wheels.—Gorman-Rupp Co., Mansfield. Ohio

MECHANICAL CHECKWRITER in moderate price field said to embody safety features and precision operation heretofore available only in more elaborate and more expensive Protectographs. Designed to make available to small business firms same protection for checks as is standard with banks

Complete **Portable**

And

Stationary **Plants**

> In All SIZES

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and other large organizations. Housed in streamlined, dark gray metal casing with maroon face and trim. Keyboard of 8 columns permits writing checks up to \$999,999.99. Forged brass type, ribbon inking and automatic control of imprinting gives clean-cut indelible impressions shredded into fibers of check. Added protection provided by engraved brass die which shreds individual's or company's name or trademark on same line and just preceding written dollar amount. Handles voucher checks or checks in sheets as easily as single checks.—The Todd Co. Inc., Rochester, N. Y.



One of the most important steps in getting maximum life from wire rope is selecting the proper size, grade and construction of rope. With the thousands of different ropes that are made, with the hundreds of different machines using rope, this is not always a simple job.

When you replace your next rope, why not make sure that the new rope is matched to your equipment. A convenient, practical way to do this is to check with your Bethlehem Wire Rope distributor. He knows wire rope. He has mill recommendations for practically every type, make and model of excavating machinery. If some unusual problem is involved, he has only to ask, and a mill-trained engineer will arrive at your job.

This engineering service is one of many reasons why it pays to deal with Bethlehem distributors when buying wire rope. A letter to Bethlehem Steel Co., Bethlehem, Pa., will bring you the names of the nearest distributors of Bethlehem Wire Rope.

ask your Bethlehem distributor

BETHLEHEM STEEL COMPANY





THIS tells about a three-conductor No. 00 Awg tellurium-rubber portable cable that supplies power to an electric shovel on a coal-stripping operation.

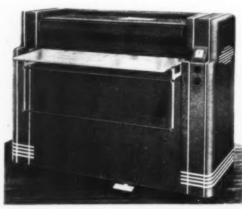
You can see from the pictures that the service is severe. Yet, when examined after more than three years of use, the cable had only a few nicks, the worst of which are shown in the small illustration.

From this you may assume that the cable is tough and does stand rough usage. We're sure of that. We're sure that each type is built right for its particular service—for shovel or dredge, coal cutter, loader, or "motor," drill, or arc welder. Get the right type for each equipment. See your G-E jobber, or call on a G-E cable specialist if you desire help on any technical problem. Address the nearest G-E sales office or General Electric Company, Schenectady, N. Y.

GENERAL % ELECTRIC

BLUEPRINT MACHINE offering as major improvement Hanovia high pressure mercury quartz lamp instead of carbon arcs will be ready for distribution after January 1. New lamp said to overcome disadvantages of carbon arcs and to enable new model machine to make blueprints at speed of 20 ft. per

SINGLE-TRANSFORMER HEAVY-DUTY WELDING SETS. two models, with ranges of 75 to 425 amp and 90 to 600 amp, feature infinitely-variable hear control providing full range regulation of output current without altering either arc- or open-circum



minute from new pencil and ink tracings using medium speed blueprint paper. Quartz lamp said to give positive uniform distribution of light to entire printing surface without flickering and to eliminate necessity of changing and trimming carbons. Lamp life guaranteed to be 1,000 hr. without any appreciable diminution of light volume. In addition to Hanovia lamp, blueprint machine will feature numerous innovations in safety, improved feeding speed control, drive, elimination of tracing slippage and wear to assure faster and more economical operation and improved printing results.—Charles Bruning Co., Inc., 100 Reade St., New York City.





of 2,600 r.p.m. Unusual pulling ability said to be outstanding characteristic. Claimed to provide new standards of flexibility and flashing acceleration because of wide speed range of 500 to 2,600 r.p.m. — Dodge Division, Chrysler Corp., Detroit, Mich.



voltage. This type of control is accomplished without breaking or changing electrical connections, and regulation over full current range of welder is controlled by easily operated handwheel located at top of unit. Glass covered wire, mica insulation and special heat-resistant baking varnish are used for transformer coils. Units are designed to operate with standard G-R remote control equipment which permits current regulation directly from welding tongs—Glenn-Roberts Co., Inc., 1009 Fruitvale Ave., Oakland, Calif.

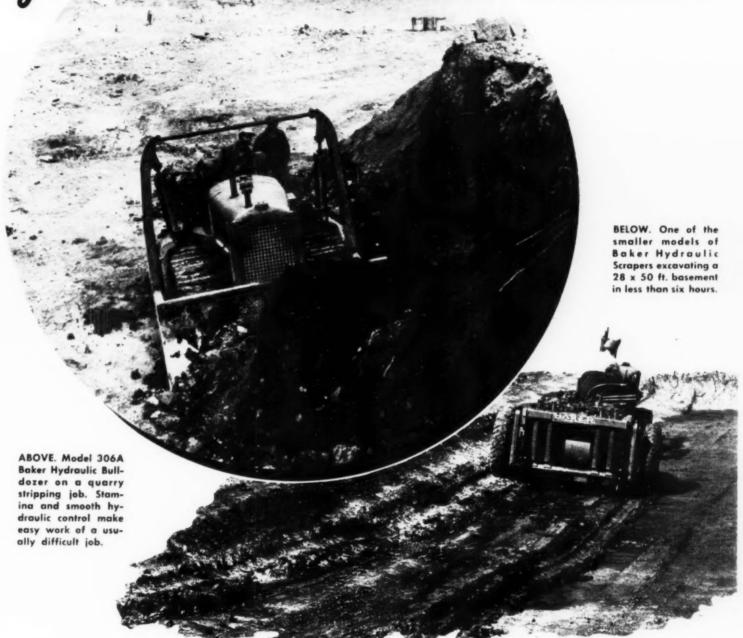
AIR-LINE LUBRICATOR, although designed primarily for rock-drill lubrication, may be used on other types of air-operated tools. Body construction consists of heavy steel tubing and forgings. Adjustment of oil feed may be made without taking pressure off chamber and without interrupting work. Lubricator said not to "siphon back" or leak when air pressure is released. Can be filled either in vertical or horizontal position. Capacity, 1 pint. Length 103/4 in. — Ingersoll-Rand Co., 11 Broadway, New York City.



DIESEL TRACTOR TRUCK designed for extra heavy work in mining, logging, coal stripping and dirt-moving operations. Maximum carrying power achievea by placing more weight on front axle, using axles and springs of greater load capacity, both front and rear and by fitting machine with maximum size balloon tires, single in front and dual in rear. Fourpoint positive drive with correct automatic differential action to all four wheels said to give positive driving action at all times, regardless of traction con-

ditions. Powered by 6-cylinder diesel motor, developing 150 hp. speed of 1,800 r.p.m. Tractor-type transmission provides six forward and two reverse speed with single lever control. Suspended double reduction drive with large gear reduction at each wheel said to provide greater factor of safety and strength in all drive parts, without excessive weight and with minimum unsprung weight and with maximum ground clearance.—Walters Motor Truck Co., 1001-19 Irving Ave., Ridgewood, L. I., N. Y.

Jobs Run Smoother with BAKERS



BULLDOZERS — Contractors generally agree that Baker Bulldozers and Gradebuilders are easier in operation and more accurate and dependable in performance because of their many exclusive features—Direct Hydraulic Lift, Great Down Pressure, Balanced Twin Cylinder Operation and Interchangeable Moldboards. Bakers can handle many jobs completely without the use of any other equipment.

SCRAPERS — Because of their flat digging angle, Baker Hydraulic Scrapers fill to capacity with far less power, operate more economically and do a cleaner job. The digging angle is constant, regardless of the depth of cut — no gouging or unsightly holes. You can get Bakers in sizes for any tractor of 25 horse power up. There's a model for your tractor.

Ask for latest Bulletins on Baker Bulldozers, Scrapers and Other Products.

THE BAKER MANUFACTURING COMPANY

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· BAKER TRACTOR EQUIPMENT

BULLDOZERS . GRADEBUILDERS . SCRAPERS . ROOTERS . ROAD DISCS . MAINTAINERS . SNOW PLOWS



agline yardage dig with a Page Automatic!

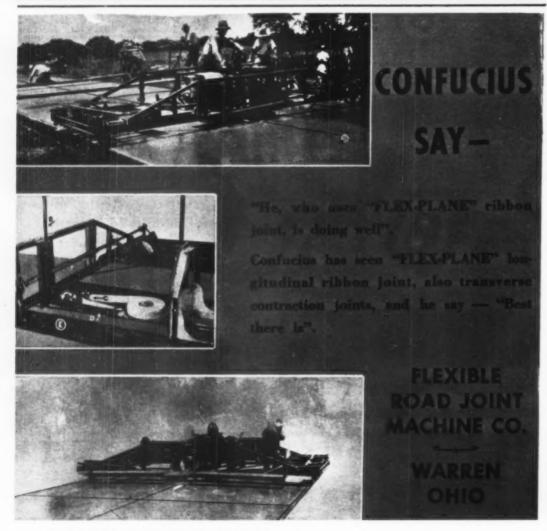
A bucket for every machine and job; capacities % to 15 cubic yds.

As they have for other users, Page Automatic Dragline Buckets can help you increase yardage and profit. The patented rounded-front design forces Automatic Buckets to use all their weight most effectively for digging; out-dig other buckets of equal size and weight.

See your equipment dealer or write direct for information about a Page Automatic Dragline Bucket of a size and weight for your machine and job!

PAGE ENGINEERING COMPANY

Page Automatic Dragline Buckets · Page Walking Dragline Machines CLEARING POST OFFICE, CHICAGO, ILLINOIS



Page 110 - CONSTRUCTION METHODS - March 1940

NEWS FROM MANUFACTURERS About Their Products

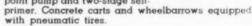
The publications reviewed below, will keep you posted on latest developments in construction equipment and materials available for your use

DIESEL ENGINES — American Locomotive Co., Auburn, N. Y. (14 pp., illustrated.) Describes and illustrates Alco diesel engines for universal application in size range from 400 to 1,200 hp. Wide field of use is in dredges and other marine equipment, oil pipe lines, irrigation pumping and electric power generation.

ASPHALTS IN CONSTRUCTION—The Asphalt Institute, 801 Second Ave., New York, N. Y. (8 pp. illustrated). Progress Pointers — Number 1 is first of a proposed series of pamphlets containing short accounts of recent developments in uses of asphalt Work described includes dam protection, swimming pools and highways.

CONSTRUCTION EQUIPMENT — Construction Machinery Co., Waterloo, Ia. (50 pp., illustrated.) Concrete mixers from 3½S up to 28S sizes of non-tilt

and tilting types with renewable drum liners, plaster and mortar mixers, bituminous mixers, dual prime pumps, power saw rigs, hoists, batching equipment, hoppers, buckets, concrete carts, wheelbarrows. New 3½S non-tilt mixer has extra low charging hopper. Bin batcher with three compartments and capacity of 21 tons is designed to speed work with 10S or 14S mixers. Pump line includes triple prime well-point pump and two-stage self-primer. Concrete carts and who



ARC WELDERS OF TRANSFORMER TYPE — Glenn Roberts. Inc., Oakland, Calif. (18 pp., illustrated.) Designed for operation by alternating current, these welders employ principle of flux diversion in transformer core to regulate output current, producing welding chaacteristics that are said to remain constant throughout the entire range of the welder. Operating instructions are given, covering primary volterating instructions are given, covering primary volterating input, output, wire size and fuse size. Diagrams of primary connections for one and two welders. List of recommended electrodes. Publication contains discussion of advantages of alternating and direct current for welding.

WATERPROOF COATING FOR MASONRY—Ranetite Manufacturing Co., Inc., 1917 South Broadway, St. Louis, Mo. (Leaflet) Product known as Ranetite No. 5 for waterproofing brick, stone and stucco above grade is transparent and has aluminum and calcium stearate base. Destroys alkali deposits often formed on surfaces of walls and protects walls from discoloration. Must be applied only to virgin masonry surfaces which have not received paint or oil coatings. Spread is about 400 sq. ft. per gallon.

STEAM GENERATING PLANT—Cleaver Brooks Co., Milwaukee, Wis. (8 pp., illustrated.) Bulletin describes and illustrates Oilbilt steam generating plant which consists of special boiler designed for use of fuel oil and an oil burner said to have positive, accurate controls of oil pressure and temperature as well as air volume, pressure and turbulence to provide smokeless combustion of fuel. Advantages claimed: (1) operating costs are known in advance of installation; (2) provides steam at guaranteed fuel-to-steam cost per thousand pounds; (3) no high, unsightly costly stacks necessary; (4) operating and maintenance expense reduced to minimum; (5) all code requirements met.



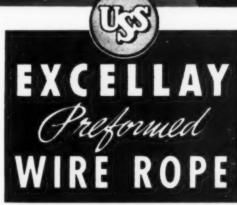


WHEREVER wire rope is used, you can be sure that not far away is one of the arms of the American Steel & Wire Company, the Tiger Brand Wire Rope Engineer.
What these men accomplish is no

What these men accomplish is no mystery to the thousands of wire rope users they contact every year. They know your problems, they talk your language. Their job is to help you select the best wire rope for a given task—to help you put wire rope

to the most effective use—in short, to help you get a full dollar's worth of performance out of every dollar you invest in wire rope.

Get to know your American Tiger Brand Engineer better. He's in position to give you practical, down-toearth, money-saving assistance. If for any reason you are not being contacted by one of these engineers, write or call us and you'll learn the true meaning of real wire rope service.





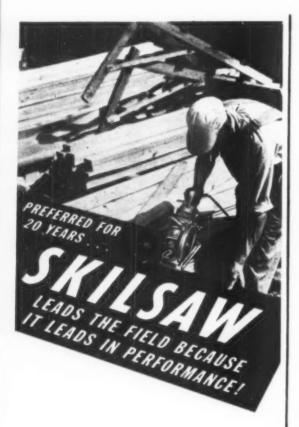
AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY

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UNITED STATES STEEL



MAKE no mistake—there is no other portable electric saw like SKIL-SAW! It out-cuts all others under heavy load. It is lighter, easier to use. It saws faster and deeper on any kind of cut... it's better in every way... because it represents 20 years of constant improvement on the first portable electric saw, introduced by us in 1920!

Buy a SKILSAW and you'll take the short road to profits—it will save half

the sawing time and cost on ALL your jobs, will help bring more jobs to you! Cuts wood, metal, stone and compositions. 9 POWER-FUL SIZES.



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Los Angelos • 2865 Webster St.,
Oakland • 22 North Ave., N.W.,
Atlanta • Canadian Brasch: 85
Deloraine Ave., Toronto •





WIRE ROPE SLINGS—Macwhyte Co., Kenosha, Wis. (56 pp., illustrated.) Written for superintendents, engineers and safety men concerned with handling problems involving use of wire rope slings. Information on sling designs, capacity and weight comparisons of slings, wire rope and chain. Tables of safe working loads. Typical assemblies. Crane signals. Breaking strength and weight comparisons. There are seven different constructions of wire rope sling bodies available in ten different types and a host of assemblies with a wide range of fittings.

PLYWOOD FOR LOW COST HOUSING—U. S. Plywood Corp., 616 West 46th St., New York, N. Y. (39 pp., illustrated.) Designed to give architect and practical builder a summary of the best practice in planning building with plywood. Research data is supplementable to the control of the

practical builder a summary of the best practice in planning building with plywood. Research data is supplemented by field experience of authors. Oscar Fisher and L. H. Meyer, showing how use of standard 4x8-ft. plywood panels cuts labor costs and material waste. "Modular" planning, using 4x4- and 4x8-ft. standard units, combined with dry-wall construction is claim-



ed to save 25 per cent of standard building costs.
Typical plans for low-cost residences, including details of siding, joints, sheathing and subflooring.
List of stock sizes and woods for interior and ex-

terior use

"QUICK-USE" CONCRETE—Pennsylvania-Dixie Cement Corp., 60 E. 42 St. New York City. (16 pp., 18 llustrated.) Booklet highlights advantages of modern "quick-use" concrete made with Penn-Dixie high-early-strength cement. Lists advantages and benefits to architects, contractors and property own-cro. Includes data on cold weather concreting and production of watertight concrete. Two pages of tables give correct procedure for mixing and curing "quick-use" concrete under indicated weather conditions and at various temperatures. Table No. 1 refers to pavements of all types. Table No. 2 shows method recommended in construction of light structural members exposed to weather—such as posts, walls and roofs. Table No. 3 contains data applicable to mass concrete work such as foundations, heavy piers and footings.

EXPLOSIVES AND ACCESSORIES—Atlas Power Co., Wilmington, Del. (43 pp., illustrated.) Information on entire line of Atlas explosives, including products for specialized fields, blasting caps, delays, squibs and other accessories. Characteristics of a number of different high explosives are tabulated for quick reference. Useful advice on electric blasting.

NEW TYPE STORAGE BATTERY—Edison Storage Battery Div. Thomas A. Edison. Inc., West Orange, N. J. (4-p. bulletin.) Describes and enumerates advantages of D-type cell batteries for use on heavyduty trucks, in trucks operating 24 hr. per day and requiring 12-hr. batteries, in trucks operating in narrow clearances and having limited area battery compartments and in trucks whose daily work schedules have outgrown original batteries. D-type cells said to have ½ greater capacity, are about ½ taller in size and have same horizontal dimensions as C-type cells. Advantages claimed: (1) Light weight; (2) rapid heat dissipation; (3) no electrolyte stratification; (4) rapid charging; (5) freedom from discharge limits; (6) durable mechanically.

RUBBER HOSE—**U. S. Rubber Co.,** 48th St. and Sixth Ave., New York, N. Y. (32 pp., illustrated.) Hints for users on selection of proper hose for their needs and



proper hose for their needs and advice on obtaining longest possible trouble-free service from hose. Descriptions and illustrations of various constructions of hose for different applications. Table of dimensions and recommended working pressures. Hose littings and couplings. Friction losses for air and water hose tabulated.



On the new Shore Parkway project at Brooklyn two centrifugal pumps one an 8-inch and the other a 4-inch, clogged and quit. Two "Can't Clog" G & R 6-inch pumps replaced the quitters and for weeks pumped 24 hours per day.

Gorman-Rupp Pumps Can't Clog. They are not quitters. That's why MORE CONTRACTORS ARE STANDARDIZING ON GORMAN-RUPP PUMPS THAN ANY OTHER MAKE. They will pump MORE WATER and pump MORE HOURS at LESS COST.

Let a Gorman-Rupp Pump prove these statements. Phone our nearest distributor for a trial pump.

THE GORMAN-RUPP CO., Mansfield, Ohio



Amazing new drill-point contains special metal harder than hardest steel. Goes through concrete, tile, slate, porcelain, etc., 50 to 75% faster. Drills cleaner, more accurate holes. Speeds up installation of expansion anchors. Saves your skilled time for more profitable work. Eliminates noisy hammering, monotonous chiseling. Doesn't splinter fragile work. No special equipment needed—use in any rotary drill. Get your share of those extra profits now possible. Send coupon for leaflet.

CARBOLOY COMPANY, INC. DETROIT, MICHIGAN

FREE LEAFLET	
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Street	State
	RBOLOY DRILL-POINTS

in

A

st

WELDING PROTECTIVE EQUIPMENT—Mine Safety Appliance Co., Braddock, Thomas & Meade Sts., Pittsburgh, Pa. (4 pp., illustrated.) Describes and illustrates thirty protective accessories for use in welding field. New one-piece or fabricated welding helmets are shown, together with hand shields, wire screen helmets, chrome leather helmets, welder's chrome leather gauntlets, leggings, sleeves and aprons. Various parts and features of M.S.A. helmets are separtely described and related items for welder's safety such as ear protectors, air-line respirators, and M. S. A. Explosimeter and Air-Mover are included.

PIPE TOOLS — **Beaver Pipe Tools, Inc.,** Warren, Ohio. (24 pp., illustrated.) New "71" series, pipe and bolt threader, threads pipe from ½ to ¾ in., right or left, and bolts from ¼ to 1 in., coarse or fine thread. Available in ratchet or non-ratchet models for operation by hand or electric power. More than 100 kinds and sizes of dies available. Other pipe tools included in catalog include thin-wheel pipe cutters, reamers, sawing vises for lightweight tubing or thin-wall conduit, heavy-duty threader (1 — 2-in. pipe), geared threaders (2½ to 12-in. pipe) knife pipe cutters, etc.

VIBRATION CONTROL FOR CONCRETE FOUNDATIONS—Kortund, Inc., 48-15 Thirty-Second Place, Long Island City, N. Y. (8 pp., illustrated.) Typical applications of steel springs in concrete foundations for heavy machinery to absorb vibration. Two basic systems of spring suspension, one within the foundation and the other outside, suspending load with pendulum action. Springs in sizes with capacities up to 30,000 lb. Description of installation procedure.

Proving Ground TESTS TRUCKS

(Continued from page 53)

crete highway is a gravel road for testing trucks on a type of surface common to rural highways all over the world. Here, especially, the effects of dust on vital parts of the trucks are observed and recorded.

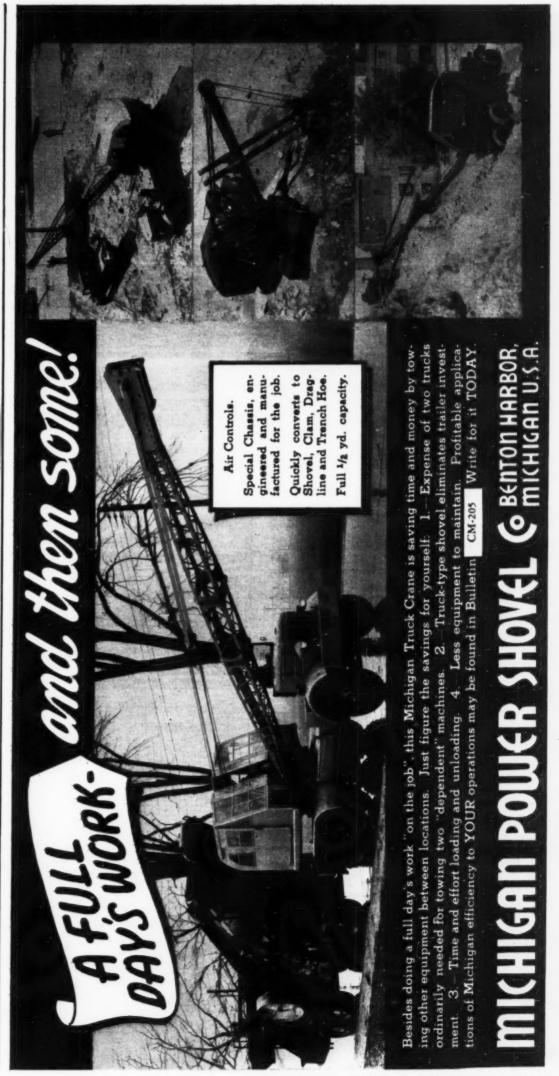
Expansion and modernization of the Fort Wayne proving ground were the result of careful engineering planning to provide every sort of highway condition to which motor trucks are subjected in actual service. Tests at the proving grounds are supplemented by exhaustive highway tests in various parts of the country.

THE FALL OF The House of Russia

(Continued from page 49)

which had to be packed at the site for shipment. Removal of the stainless steel statue on the tall pylon was the outstanding feature of this phase of the operations. After the semicircular pavilion had been stripped of its valuable materials, the contractor bisected the building by cutting a swath through the center and then worked

(Continued on page 114)



GASOLINE ELECTRIC DIESEL

Clyde hoists . . . the finest in the building and construction field . . . are available in one, two and three drum styles, in a wide range of sizes and capacities offered only by Clyde.

A new Bulletin 34 contains complete specifications and construction details on these superior machines. Send for your copy now and see for yourself how this modern, extra quality equipment will profitably handle your hoisting problems.



"You'll Take Pride In Your Clyde"

CLYDE IRON WORKS, Inc. DULUTH, MINN.

(Continued from page 113)

both ways from this opening with two crawler cranes, salvaging the structural steel

Because of the special character of the demolition and salvaging job, other craft unions besides the building wreckers claimed jurisdiction over certain features of the work. Marble setters, stone setters, glaziers, electricians, plumbers and riggers, for example, contended that they were legitimately entitled to dismantle materials and equipment in their special provinces, while the wreckers regarded the entire job as properly belonging to them. The contractor worked out an agree-



MARBLE SETTERS separate thin polished slabs from plaster of paris spot backing as first step in salvaging marble facing for packing and shipment.

ment with the unions which put skilled building mechanics in charge of salvaging valuable materials and left all ordinary demolition to the wreckers. This arrangement proved advantageous both to the workers and to the contractor, as the skilled mechanics were able to strip and handle materials quickly and efficiently, without damage or loss of time.

Because of the short days, it was feasible to employ only one shift on hazardous demolition work. A typical force employed on the job at the end of the first month comprised about 225 workmen, of whom about 50 per cent were skilled building mechanics and the remainder were wreck-

Stainless Steel Statue

To take down the 79-ft. statue representing a Soviet workman on top of the 180-ft. pylon, the contractor built a timber platform on the roof of the pylon and set up a jinniwink derrick which could be fitted into the small working area available. This rig lacked sufficient reach to take down the upper part of the statue. A welded latticework steel boom about 90 ft. high was raised to the platform and erected as a gin pole to dismantle those parts beyond the reach of the small derrick.

In dismantling the statue, the contractor separated the figure into the eight sections which originally had been assembled on the pylon to form the complete unit. The figure consisted of a thin stainless steel shell supported on interior steel lattice framing, with bolted connections which had been made with ribbed rivet bolts. Joints between sections of the stainless steel shell had been welded to make

them continuous.

Tubular steel scaffolding was erected on the platform around the statue, and welded joints between sections were cut by hand without damage to the stainless steel. After interior field connections of the steel. frame had been unbolted, the gin pole dismantled successive segments of the statue. operating a load line which was reeved from the boom of the jinniwink derrick. Working conditions required that the head be removed first, followed by the uplifted arm and sections of the body. After the gin pole had dismantled the figure down to the crotch, the small derrick lowered the tall boom which had served for this work and completed removal of the remainder of the statue.

Dismantling Pylon

To strip the valuable marble facing from the 180-ft. pylon without erecting tall scaffolding around the exterior, an ingenious platform hoist was rigged up inside the steel framework of the structure to lower marble slabs after they had been removed by marble setters working on hanging scaffolds. The hoist platform traveled on three cable guides which were hung from the interior steel frame.

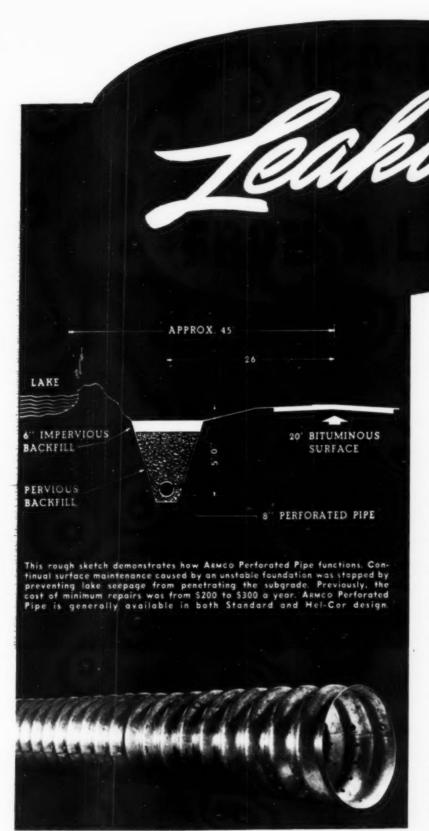
After completing demolition of the statue, the small derrick on the roof of the



CAREFUL PACKING of marble in dimensioned crates is observed by contractor's representative, who prepares six copies of manifest required to pass material through customs. Owner's inspector checks each crate before top is closed.

pylon raised and set a guy derrick into the top of the structural steel frame. The guy derrick lowered the jinniwink and began dismantling the steel frame, which had been bolted with ribbed rivet bolts. Ordinary open-end wrenches were used to start the nuts on the bolts except in about

(Continued on page 116)



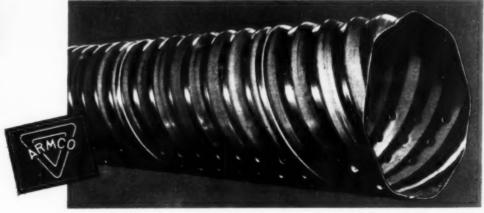
• For years surface maintenance was a trying problem on this road by a city reservoir. Permanent repairs were impossible because water seepage from the lake kept the subgrade saturated. Now Armco Perforated Pipe drains the water and has eliminated maintenance cost caused by faulty subgrade.

You too can reduce repair bills and add years to the life of your pavements in wet unstable areas. Simply install Armco Perforated Pipe. It is easily handled in any length that can be shipped. Once in place the pipe sections are joined into a continuous line by strong tight couplings. Scientifically designed perforations admit water freely. Yet shifting soils and other outside forces are not likely to result in clogging or breakage.

If you are troubled by wet unstable foundations, an ARMCO Drainage Engineer will gladly work with you to keep your roadbeds dry and firm. Just write us for complete information. Armco Drainage Products Assn., 5027 Curtis St., Middletown, Ohio.

ARMCO Perforated Pipe ORIGINATED AND DEVELOPED

BY ARMCO ENGINEERS







THE OWEN BUCKET CO.

6020 BREAKWATER AVE.

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Branches: New York, Chicago, Philadelphia, Berkeley, Cal.

Want Daytime Efficiency on that Night Job?



National Carbide Lanterns — signal of red, blue or green ideal for emergencies.

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Send information on lanterns or V-G Lights with absolutely no obligations.

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POWER SHOVELS

DRAGLINES

CRANES

TRUCK SHOVELS, ETC.

% to 2 Cu. Yds.

HERCULES ROAD ROLLERS

Write for New Catalogs



(Continued from page 114)

10 per cent of the cases, where cutting was required. As demolition progressed, the guy derrick was jumped down to successively lower levels inside the steel frame, in the same manner as when wrecking a steel frame building.

Marble and Glass—With the exception of a hard red quartzite 2 in. thick used on the front of the pylon, most of the exterior and interior wall facing consisted of marble about 1 in. thick. The marble in general had been set against spots of plaster of paris applied to the cinder block backup. Walls and joints between the marble pieces had been sealed with an elastic compound to keep out the weather. Because of the method of erection, the stripping of the marble in the walls was carried on by skilled mechanics without great difficulty.

Large panels of glass blocks in the curved facades of the building were detached and lowered in units by truck cranes. The original intention had been to separate the blocks for packing and



EACH CRATE IS MARKED with marble classification and number by contractor's inspector for later painted stenciling before being loaded on to truck.

shipment, but this procedure was found impractical, and the panels were crated and shipped intact. In attempting to separate the glass blocks of the first unit, it was discovered that the horizontal joints of the panels were reinforced with expanded metal mesh embedded in the mortar.

Scaffolding — Where feasible, the contractor utilized suspended scaffolds in dismantling the pavilion. For most of the exterior and interior demolition, however, working conditions dictated the use of pole scaffolds, and the job utilized a large quantity of welded tubular sectional scaffolds, illustrated by several of the photographs

Crates and Cases — To handle the huge task of packing 3,300 tons of material, the Albert A. Volk Co. entered into a contract with a firm which specializes in this kind of work. A number of cases (solid boxes) and crates in which materials originally had been received were still available for use. The contract accordingly was drawn up on the basis of four separate unit prices per cubic foot:

(Continued on page 118)

HANDBOOK

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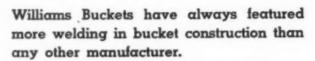
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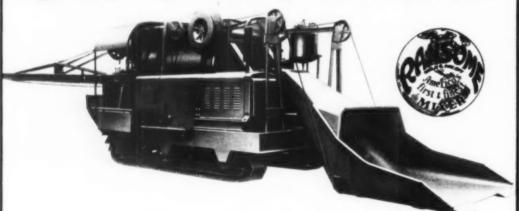
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- 8. Simplified Design and Construction

Send for Latest Bulletins

RANSOME CONCRETE MACHINERY CO.

DUNELLEN

NEW JERSEY

(Continued from page 116)

(1) in used crates, (2) in used cases, (3) in new crates, and (4) in new cases.

Truck Cranes — For handling crates, cases, materials and equipment at the site and for aiding demolition of the structure, the contractor rented three truck cranes which were kept constantly busy-throughout the working hours of each day. These cranes loaded trucks with materials to be hauled from the site.

Direction — Demolition of the Soviet Pavilion was carried out under contract with Georgi N. Zaroubin, commissioner for the U.S.S.R., who was in complete charge for his government. For the Albert A. Volk Co., contractor, New York, the planning and execution of the demolition work were directed by A. K. Fleschner, president, Michael Sheriff, treasurer, and Charles Fleschner, secretary.

BlastingMILE-LONG DITCH

(Continued from page 69)

mud in the ditch. Test shots were made to determine a satisfactory loading for excavation.

Limits on loading and use of pumps, hose and pipes for drilling raised labor costs on the ditch. Total cost is estimated at about 26c. per cubic yard of material excavated. About 38,000 lb. of du Pont ditching dynamite was used in initial blasting and cleanup work. In spite of the small shots necessary, the engineers in charge believe that dynamite excavation moved more yardage than could have been obtained by other methods in the same time.

Floodlighting FOR OUTDOOR CONSTRUCTION

(Continued from page 50)

the amount invested by the contractor in construction mounts steadily as the work progresses. Whatever will expedite the job and release this material for other operations is a definite factor in the year's profits. Further, it sometimes is important to take advantage of good weather in branches of the business that can be carried on only at favorable seasons. It must be noted that adequate lighting is the only

(Continued on page 120)

EVIDENCE PILES UP!

CALCIUM CHLORIDE IS NEEDED IN COLD WEATHER CONCRETING



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WHEN statements stand up under II the scrutiny of keen scientists year after year, they become the "common laws" of business. No common law ever had more continuous acceptance, nor more complete verification than the one which says, "Use Calcium Chloride in Cold Weather Concrete."

Contractors know that the use of calcium chloride in winter concrete construction permits quicker finishing and use of floors and pavements. They know also that it permits earlier removal and re-use of forms.

These and many other advantages come from

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District of Columbia Bulletin No. 42

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Reports from Concrete Products Industry



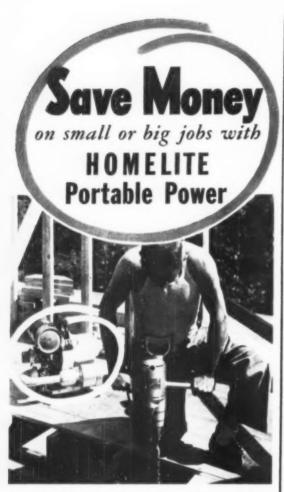
the accelerated rate of hardening, the high early strength, the greater workability and ease of placing.

The proofs are found not only in the economy and quality of work, but in the reports of many years'

testing by competent testing laboratories.

Evidence piles up. Don't miss your most important aid in placing cold weather concrete. Put calcium chloride into every batch. Write for literature giving standard specifications and reports of foremost testing engineers, or refer to Sweet's Catalog File for A.S.T.M. Specifications and other data.

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Use it everywhere. A Homelite Generator is small and compact—easily portable. The 1800 watt unit, for example, weighs only 83 pounds complete with engine. One man can pick it up and carry it. Long cables that sap power are unnecessary. Yet in spite of its small size, a Homelite is very rugged, dependable and completely weatherproof—the best you can buy.

Send for Bulletin

Homelite Corporation

2003 Riverdale Ave., Port Chester, N. Y.

(Continued from page 118)

answer to the problems of night construction. Reliable data show conclusively that production is increased by from 10 to 25 per cent through an increase of illumination that costs only from 0.5 to 2 per cent of the payroll expense. In every case, the greater production was brought about because of the ease with which the men could perform their work and detect defective workmanship. Thus, a substantial saving on the contract is effected by adequate floodlighting. Where workmen receive extra pay for emergency overtime at night, this economy becomes greater in proportion to the additional amount thus expended.

High intensity floodlighting, installed by a competent engineer, seeks out and exposes every condition that might cause accident. Workmen move about and handle tools with the same certainty and confidence and speed as in daylight. It requires the saving of only a few minutes per night of each workman's time to cover the cost of lighting, and the prevention of only one accident probably will defray the entire cost of the installation. Statistics show, in the case of accidents, that for every dollar of compensation paid by the insurance company, the employer pays an average of at least four dollars to cover resulting costs and indirect expense. (Report of Committee on Light and Safety, Illuminating Engineering Society.)

It also is important to protect materials and tools from theft. On large operations this cause of loss often mounts to a large sum. Correct floodlighting makes it easy to police the work and hard to steal or damage property.

Two Systems of Lighting

Two general systems of lighting construction work are commonly used. These may be referred to as (1) the distributed system and (2) the centralized system. In the distributed system reflectored light sources are placed over active areas and temporary wiring is strung to convey power to them. As the work progresses, the lights and wiring are changed to new locations. The centralized system utilizes floodlight projectors and contemplates a more or less permanent location for the light sources convenient to a source of power, the light being projected to the active areas. Except for the few instances where the distributed system is essential, the centralized system (Fig. 1) will be found lower in first cost and maintenance and afford the greater flexibility.

A variety of floodlights are available

A variety of floodlights are available (Fig. 2), including types of mechanical construction, wattage and character of light distribution that will satisfy the wide range of conditions found in construction work. The wattage range is from 200 to 1,500 watts; the beam spread from 12 to 90 deg.

Construction work takes many different forms and it is difficult to establish rules relating to the amount of light required and the most effective manner to apply it. It is desirable to study conditions on the ground preliminary to making the lighting layout. A rough estimate of power re-



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quirements may be obtained by allowing 0.25 to 0.50 watt per square foot of ground area.

It is desirable to mount the floodlights as high as practicable above the work. This is usually accomplished either by locating the lights on the temporary scaffolding or by framing up towers (Fig. 3) for this particular purpose. The higher the light sources are placed the more effective is the distribution of light and the less likelihood there is for shadows and disturbing glare. Practical considerations make it necessary to compromise these factors with the need for convenience in maintenance.

Two Crawler Cranes ON INDIANAPOLIS HOUSING PROJECT

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sq.ft., working the concrete around the sleepers on 16-in. centers, in $2\frac{1}{2}$ hr. A floor pour of this size took about 60 cu.yd. of concrete, the rate of placing and finishing being retarded by the shallow depth



TO INSULATE second-story ceilings, 4 in, of rock wool is blown into place on top of board lath. Man partially visible on stepladder in background is handling hose through opening in ceiling.

of slab. On ordinary flat slab construction, the builder states that the crane and bucket are easily capable of placing 40 cu.yd. an hour.

Progress—A power excavator pulled on to the job to start digging basements on

(Continued on page 122)



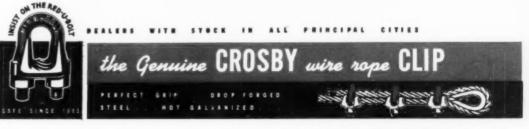
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Besides discussing the basic contractual forms, such as guaranteed

Besides discussing the basic contractual forms, such as guaranteed lump sum price, pure agency types, etc., the book takes up separately the various parts of the contract, showing what should go into the advertisement, agreement, general conditions, specifications, estimate, etc., to make each effective.



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(Continued from page 121)

March 22, 1939. The project was scheduled for completion and initial occupancy about the first of this year.

Personnel — Granger & Bollenbacher, Chicago, were architects for Marcy Village, owned by the Marcy Realty Co. For E. A. Carson, the builder, Pearl R. Alexander was superintendent in charge of construction, assisted by Charles E. Bell. field superintendent.

Channelization GUIDES TRAFFIC

(Continued from page 53)

tures for night driving include curb inserts, flashing yellow signals at approach ends of islands and sodium vapor lights at points of intersection. The channelization is designed to permit smooth flow of through traffic and interchanging traffic with lessened danger of unexpected vehicle movements which confuse drivers and cause accidents. Walter N. Frickstad, city engineer, Oakland, supervised the work.

Standardized Cable FOR OPERATING SCRAPERS

(Continued from page 55)

experienced operator never brings his pushbeam stops together. Also, it's a good rule never to load or unload when the scraper and tractor are in a sharp turn, so the cables are not apt to become fouled.

The careful operator never allows his cables to become slack on the drums. He keept a taut line at all times, thereby preventing the forming of loops in the cable or fouling the cable on the drum. Care should be taken in reeling in slack line, to prevent impact when the line becomes taut and to guard against the cable catching on the cable guard.

Some operators bring the scraper apron up with a bang to shake the load. This is severe on cables and should not be tolerated.

A reasonable amount of care on the part of the operator will add many pay loads to the life of the cables, thereby reducing cable cost and extending the periods between shut-downs for cable replacements. Broken cables may mean costly delays. By changing or replacing a cable before it breaks, the operation may be done between shifts, so that productive time is

not lost and workmen are not made idle.

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When cable is to be replaced, the same size and construction should be used as that with which the equipment was originally furnished. The best grade of cable is none too good for the severe service and high output that characterize the conditions under which these tools operate. Nothing less than improved plow steel cable should be considered, preferably of preformed construction. While this cable may be a little higher priced than some other kinds, it is our experience that the added investment will be returned many times in longer cable life and less forced idleness caused by cable changes and replacement.

Pumped Fill FOR WASHINGTON AIRPORT

(Continued from page 72)

worked at the site with the army-owned 18-in. Talcott. In the river, within economical pumping distance of the landing field, was 19,673,000 cu.yd. of suitable material from which to take the 14,500,000 cu.yd. gross volume required for a net hydraulic fill of 11,370,000 cu.yd.

Dike Construction — To retain the fill and provide flood protection, the engineers built 12,500 ft. of levee around the waterfront boundaries of the field by pumping hydraulic fill to El. 12 and topping it with dragline construction to El. 16. On part of the east boundary, where channel dredging and gravel operations had left spoil banks above water level, dragline work only was required to build the levee.

Building Runway Fills

Economical depth for trenching runway areas was determined as El.-12 with a bottom width of 200 ft. regardless of width of runway. Dredging to this depth removed most of the soft muck overlying sand under 17,000 lin. ft. of the main runways, though occasional muck pockets went deeper than 12 ft. Under the remaining 4.257 ft. of runways, principally in the east-west runway at the south end of the field, the muck was so deep that removing the top 12 ft. could contribute little to the stability of the fill. In this area of deep muck, running up to 45 ft. thick, the silt is removed or consolidated by controlled filling.

As runway trenches dredged to El.-12 and 200-ft. bottom width are all under water, the sides slump but little. Material dredged from the trenches is pumped on land and into intermediate areas between the runways.

(Continued on page 124)

MARMON-HERRINGTON All-Wheel-Drive A "NATURAL" FOR UTILITIES, ROAD WORK, LOGGING, OIL FIELDS, ETC.

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(Continued from page 123)

Runway fills are built up in two main lifts. The first lift, carried to El. 12, fills the trench and spills over on side slopes of 20:1. On both sides of this fill, draglines throw up retaining levees 170 to 220 ft. apart, depending upon the width of runway desired, to El. 20, using material bulldozed and scooped from the center of the fill. The second lift of hydraulic material completes the fill between these levees to El. 20, providing a surcharge of extra material which serves first to accelerate settlement and later to form the shoulders for an ultimate runway width of 500 ft.

End Filling of Trench

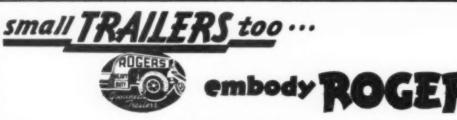
Material for both the first and second lifts is placed by end filling from two pipe lines working toward each other. Pipe lines are carried on new fill and are extended a length at a time as filling progresses. The heavier sand and gravel placed to minimum 24-ft. depth in the first lift squeeze some of the silt, remaining in the bottom of the trench, into the soft sides and pushes the rest ahead of the fill. Where deep silt lies under the trench, it is well consolidated by the loading of heavy material, as revealed by repeated borings.

End filling stops when the approaching fills are about 200 ft. apart, and a pipe line fitted with bottom spill pockets is extended across the gap, filled with silt and dredge fines. Sand and gravel discharged from the spill pockets start a longitudinal wedge in the soft material. As the wedge builds up until it fills the gap, it displaces the soft material through the sides of the trench. Borings show that this procedure

makes a perfect closure. To prevent scouring of the fill, pipe lines discharge through a special end section consisting of the lower half of a piece of pipe containing several bottom pockets and having a sloped baffle at the outer end. This pipe section drops heavy, coarse materials under the pipe line and distributes most of the water, carrying the finer particles, in a wide spray. Two or three pipe sections next to the discharge are likewise equipped with bottom pockets for depositing coarse material.

Administration-Authorization for the Washington National Airport was given Sept. 1, 1938, and the project will be partly ready for service July 1, 1940. Several government agencies are cooperating in building the airport. The Civil Aeronautics Authority is responsible for general plans, PWA furnished a grant of \$6,300,-000, and WPA appropriated \$3,586,561 and furnishes common labor and minor materials. The Public Buildings Administration is in charge of designing and constructing all buildings, and the Public Roads Administration directs relocation of the Mt. Vernon highway.

Hydraulic fill work is under the direction of the Washington District, U.S. Engineer Department, Col. R. S. Thomas, district engineer, with Capt. J. B. Newman and E. J. Merrick in charge at the



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Are you taking full advantage of the services the distributor can offer you when you go on a new job—especially when that job takes you into strange territory? Give some distributor a tryout on your next contract. Look him up in his classified telephone book. You'll find him listed usually under "contractor's equipment."

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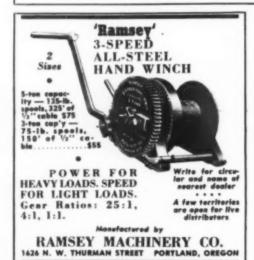
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